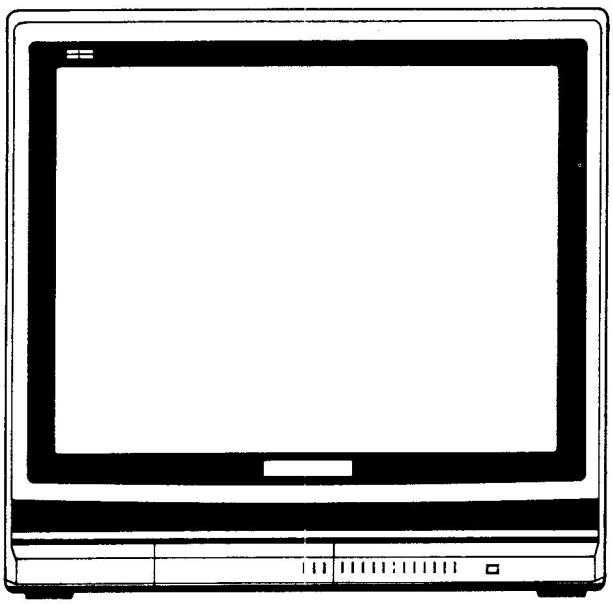
HITACHI CPT-2174 CPT-2176/2476

SERVICE MANUAL

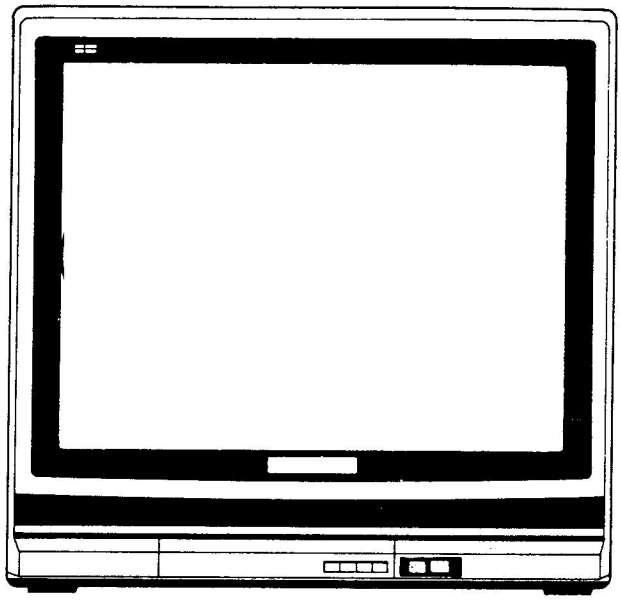
PAL-SYSTEM
G6P CHASSIS

:AUTION:

efore servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product afety Notices" in this Service Manual.



CPT–2174



CPT–21/2476

TECHNICAL SPECIFICATIONS

'V standard ..... 625-line single standard
:hannel coverage ..... UHF channels 21-68
\erial input impedance ..... 75 ohm unbalanced

ntermediate frequencies
I.F. Luminance 39.5MHz
I.F. Sound 33.5MHz
I.F. Chrominance 35.07MHz
F.M. Sound 6.0MHz
Colour subcarrier 4.43MHz

:ocusing ..... Electro static
Mains voltage 240V 50Hz
:use 3.15A
'icture tube . 21" A51 JFC61X 24"A56JKZ61X04

Programme Selectors . CPT 2174 12 Light action buttons
CPT2176/2476 programme up/down buttons with 30 programme remote control.
Speaker ..... 5" by 3" 8 ohms
Sound output ..... Approx 3 watts
Power consumption ... CPT2174 Approx 84 watts
CPT21/2476 Approx 92 watts

Dimensions	CPT 2174/2176	CPT 2476
Width	500mm	565mm
Height	480mm	548mm
Depth	475mm	510mm
Weight	approx. 22kgs	approx. 30 kgs

:ince this is a basic circuit, the value of the parts and specifications are subject to be altered for improvement.

SOLID STATE COLOUR TELEVISION

SEPTEMBER 1986

SAFETY – PRECAUTIONS

WARNING: The following precautions should be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatter proof goggles are worn. People not equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.

2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on the chassis.

3. When replacing chassis in the cabinet, ensure all the protective devices are put back in place, such as: barriers, non-metallic knobs, adjustments and compartment cover or shields, isolation resistor-capacitor, etc.

4. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area. Particularly note R.G.B. lead dressing. Ensure they are dressed well away from the horizontal scan and FBT circuitry.

5. Always use the manufacturer's replacement component. Always replace original spacers and maintain lead lengths. Especially critical components are indicated thus △ on the parts list and should not be replaced by other makes.
   Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.

6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.
   Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

INSULATION

Insulation resistance should not be less than 10MΩ at 500V DC between the mains poles and any accessible metal parts.
Also, no flashover or breakdown should occur during the dielectric strength test applying 3kV AC or 4.25kV DC for two seconds between the main poles and accessible metal parts.

HIGH VOLTAGE

High voltage should always be kept at rated value o the chassis and no higher. Operating at highe voltage may cause a failure of the picture tube o high voltage supply and, also, under certair circumstances could produce X-radiatior moderately in excess of design levels. The higl voltage must not, under any circumstances, exceec 27kV on the chassis.

X-RADIATION

TUBES: The primary source of X-radiation in this receiver is the picture tube. The tube utilised for the above mentioned function in this chassis is specially constructed to limit X-radiation.
For continued X-radiation protection, replace tube with the same type as the original HITACH approved type.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACH television receivers have special safety relatec characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a △ on the schematics and replacement parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create electrical shock, fire, X-radiation, or other hazards.
Product Safety is continuously under review and new instructions are issued from time to time. For the lastest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of HITACHI Service Manuals, may be obtained at a nominal charge from your HITACHI SALES CORPORATION.

TUBE DISCHARGE

The line output stage can develop voltages in excess of 25kV; if the E.H.T. cap is required to be removed, discharge the anode cap to chassis via a high value resistor, prior to its removal from the tube.

Circuit Description

Tuner and I.F. Stages

The tuner used in this chassis (type ET568A) is powered from the 12V supply and by a tuning voltage which is obtained from IC1101 and associated circuitry. The IF output from this tuner is fed via the saw filter CP201 to pins 7 and 8 of IC201.

IC201 type HA11485 supplies A.G.C. and A.F.C. outputs as well as performing vision and sound demodulation.

A.G.C. control is preset by R210 and a D.C. output is obtained at pin 3, then fed to the tuner via R208.

An A.F.C. output is available at pin 1 and is controlled by the tuned circuit L203/C212 on pin 25. It is fed to the tuner via R004/ZD001/D001.

L204/C207 and R212 on pins 23/24 form a tuned circuit for the vision detector stage, with L202/C209/C210 on pins 27/28 performing sound rejection.

C216 and C201 provide decoupling for the internal I.F. amplifier stage of IC201.

Sound Circuitry

Sound I.F. detection is carried out internally by I.C. 201, then amplified and fed out at pin 18. It is then applied to pin 19 via L403/C407 and the 6 MHz filter MF401. Further amplification is carried out internally, with C411 on pin 21 providing decoupling.

Demodulation is performed internally in conjunction with the external tuned circuitry of L401/C412, L402/R408 etc, and the audio signal is output from pin 17.

From pin 17 the audio signal is fed via R406 and the tone control, then returned to IC201 pin 12 via C403. Further amplification takes place internally and the amplified audio emerges at pin 11, from where it is applied to the two transistor audio output stage Q421/Q422, then fed to the speaker via C425 and T421.

A stereo jack socket JA401, is connected to the secondary of T421 to enable private listening by headphones if desired.

Volume control is obtained by a D.C. voltage at pin 13 of I.C. 201. This D.C. voltage is varied by IC1101 and associated circuitry (See tuning and selection circuit description).

Feedback is fed from the junction of R422/C422 in the output stage, and applied to pin 10 of I.C. 201 via C401, R401, R402 and C402. In this way, the gain of the audio output from I.C.201 is controlled.

I.C. 201 is operated by the 12V supply fed to pin 5.

On remote control models the audio output from pin 17 is fed out from the chassis to the audio/video panel via the VA plug at VA4. It is then returned to the chassis at VA3, from where it is fed to the tone control and pin 12 of IC201 as described previously for manual models.

Luminance

Video detection is carried out internally in conjunction with L204/C207/R212, and after further amplification the composite signal emerges at pin 30 of I.C. 201. It is then applied to the emitter followers Q201/Q202 via R214 and the 6 MHz rejector CP202. The output at Q202 emitter is fed via R301, DL301 and C301, then applied to an internal video stage at pin 21. The frequency response of this stage is determined by the setting of the picture control. Black level clamping and further amplification is carried out internally in I.C.501, and the luminance is fed from pin 4, then applied to the C.R.T. base via Q301/Q302 stage.

On the remote control models, the video output from the emitter of Q202 is fed via the VA plug at VA6 to the audio/video board. It is then returned via VA8 and input to I.C.501 pin 21 as previously described.

Chrominance

The composite signal at Q202 emitter is fed to the band pass circuitry of L501/R502, L502/C503 and R503, then input to pin 26 of I.C. 501 via C504. Internal amplification then takes place, which is controlled by the D.C. saturation control level at pin 27, and by the internal A.C.C. circuit, the operation of which depends on the amplitude of the burst signal. The signal emerges at pin 29 and is applied to the delay line DL501. The R-y and B-y signals are separated by the delay line in conjunction with T501, which also introduces the required phase shift. The R-y and B-y signals are then applied to pins 36 and 35 respectively for demodulation.

A sub carrier oscillator of 4.43 MHz is applied at pin 31 by X501, while an internal flip-flop and pal switch inverts the R-y carrier output every line period.

The red and blue signals are then matrixed to produce a green signal, and the R-y, G-y, B-y signals emerge at pins 2, 3 and 1 of IC501 respectively.

A portion of the line pulse at C782/C785 junction is fed via R703/R713 and input to pin 14 of I.C. 501. This line pulse controls line blanking and black level clamping, with vertical blanking being obtained internally.

An automatic beam current control is employed on this chassis. Beam current is sampled at pin 4 of the fly back transformer and is taken to the H.T. line via R765/R766, and is also applied to D302 anode. The cathode of D302 is tied to 14V at Q791 collector. Under low beam current conditions, D302 anode will be above 14V and therefore it will conduct, maintaining a constant 14V at its anode. Should an excessive increase in beam current occur due to an overbright picture, the voltage at D302 anode will fall dramatically. D301 will then conduct and apply a low voltage via R309 to the contrast control input at pin 22 of IC501, thus reducing the contrast and hence the beam current. This I.C. is driven by two L.T. supplies. The chassis 12V supply is input at pin 25 and approximately 12V is applied to pin 24 from D700 on manual models or Q904 on the remote chassis to start the horizontal oscillator and drive.

Horizontal Stages
The composite signal from Q202 emitter is applied to IC501 pin 18 via R701, C701, R702 and fed internally to a sync separator stage. Line synchronization is done internally.

A portion of the line pulse is fed via D702 and R710 and applied to pin 9. This line pulse is compared with the line sync pulse internally, and any frequency difference will cause a corrective voltage to be applied to the oscillator, thus maintaining frequency control.

The line oscillator stage is controlled by the external components X701, C708, L703, R714 and R715. This oscillator output is changed to a squarewave shape in the I.C. then output from pin 7 and applied to the base of line drive transistor Q721 via R712. T721 couples Q721 to the line output transistor Q781. Q721 is powered by the H.T. supply via R725/R726, with Q781 also being supplied by the H.T. voltage via pins 6/10 of the flyback transformer T761.

Several voltage supplies are taken from T761 and used to power the C.R.T. output transistors, the vertical output IC and the memory I.C. etc. The 200V supply required to drive the C.R.T. transistors is obtained from the induced line scan voltage available at pin 7 of the F.B.T. It is protected by R771, rectified by D763 and smoothed by C765.

A 25V supply for the vertical output IC681 is taken from D762 smoothed by C764 and is given protection by the fusible resistor R762.

The memory I.C. of the tuning circuit requires a −30V supply to operate. This is obtained by D772, smoothed by C1117(C1109 on remote model) and protected by R761. R761 is also the fusible resistor which gives protection for the 15V obtained by D761 and smoothed by C762. This 15V is then fed to Q791 stage which gives a stabilized 12V supply at its emitter. This is the common 12V supply for the chassis.

Excessive E.H.T. could be generated on this chassis by an increase of H.T., low line oscillator frequency, or by reduced value of the tuning capacitors C782/ C785 on Q781.

To prevent this happening, the chassis employs two protection circuits. The line pulse from pin 5 of the F.B.T. is fed via R758, rectified by D751 and applied to the cathode of ZD752. Under excessive E.H.T. conditions, the threshold value of ZD752 will be exceeded and it will conduct, therefore applying a voltage to the gate of Q902. Q902 will then turn on and place a virtual short circuit on the H.T. line, therefore preventing further E.H.T. generation.

ZD753 monitors the voltage at the emitter of the line output transistor Q781. Should the threshold value of ZD753 be exceeded, then it will conduct and place a voltage at the gate of Q902, thus preventing E.H.T. generation as previously described.

Vertical Deflection Stages
Vertical synchronisation is carried out internally by I.C. 501 from the composite signal input at pin 18.

IC501 incorporates a vertical countdown stage which replaces the conventional field oscillator, and has the additional advantage that no external frequency adjustment is required. The external components R602/C686, are used to provide ramp generation, and a vertical sawtooth is obtained a pin 16. This sawtooth is then fed to the vertical driv stage of I.C.501, creating a vertical output at pin 1 which is fed to pin 4 of I.C.681 via R601.

I.C. 681, type μPc 1378H, consists basically of driver stage supplying an output stage and flybac generator. D681/C682 determine the flybac generation time, and the vertical output from pin 2 i then applied to the deflection coils.

A deflection current occurs at the junction of R620 C621. This is fed via R623, R625, C622 and added t feedback obtained from the output of I.C.681 vi R681, R611 and C611. The overall result is then inpu to pin 16 of IC501 to control linearity and height wit R623 being the variable height control.

I.C.681 is supplied with approximately 25V at pin 6 which is obtained from the flyback transformer.

Power Supply for Manual Models
Mains rectification is performed by the full bridge rectifier D901 and approximately 300V is obtained at the junction of R901/C906 which is then applied to the collector of switching transistor Q901; FS901 supplies mains protection.

At switch on C905 charges via R902/R903 and turns Q901 on. Positive feedback is then applied to the base of Q901 from T901 secondary windings via R905/C911 and R906. This feedback turns Q901 hard on producing saturation. As C911 charges the positive feedback is rapidly reduced, and as a result Q901 will be turned off. C905 will then charge up again via R902/R903, thus turning the transistor on and repeating the procedure. Once the switching transistor has started operating, it will switch off and on at a frequency determined by R905, C911, R906 and is synchronised to the line frequency by feedback applied to Q901 base via R908, D905.

Stabilisation of the power supply stage is performed by thick film module CP901. This module has a reference voltage of approximately 110V applied to Pin 5, and a feedback voltage input at pin 3 via T901 secondary and D903 with smoothing performed by C910. These voltages are compared internally by CP901 and any difference will result in an output from pin 6, which is applied to the base of Q901 as a corrective voltage thus maintaining a constant H.T. supply.

H.T. rectification is performed by D902 then filtered and smoothed by T901 primary winding and C909 to supply the chassis with 111V.

Power Supply for Remote Models
The power supply for the remote models, operates the same as manual models as far as H.T. generation and stabilisation is concerned. Two additional transistors are added; Q904 stage supplies approximately 12V to pin 24 of IC 501, which is independant to the chassis 12V supply. Q905 only comes into operation when the standby command is received by IC1101. When this happens, a voltage is applied to the base of Q905 turning it hard on, pulling its collector low. This low is applied to Q904 base via R916 and turns Q904 off. The voltage supply to I.C.501 pin 24 will now disappear, and the horizontal circuits of IC501 will cease to operate, thus preventing further E.H.T. generation.

Tuning and Selection Circuit (Manual Models)
On the manual models the tuning and selection is performed by three I.C.s. I.C.1101 type M50161-554SP, is the main control I.C., which is used in conjunction with I.C.1102 type M58658p, which is the memory. I.C.1104 type M50143-006p generates an on-screen display to indicate volume level, programme number, A.V. indication, programme recall and programme search mode.

The three I.C.s are driven by the 5V supply, with an additional -30V supply applied to pin 2 of IC 1102.

Channel selection, search tuning, volume +/– etc is carried out by I.C. 1101. The operation selected is determined by which of the pins 2, 3, 4 or 10, 11 or 12 are connected via the appropriate switch and diode to pins 5, 21, 27 and 28.

Should the search operation be initiated, the mark/space ratio output at pin 20 will alter, thus the 31V at Q1101 collector will be chopped as the transistor turns on and off. The resultant average voltage will be integrated and filtered by R1103 and C1104, R1104/C1105, producing a variable voltage, which is applied to the tuning voltage terminal of the tuner. Whilst tuning is taking place, digital information is fed to pin 12 of IC1102 from pin 13 of IC1101 along with a 3 bit code from pins 1, 2 and 3 of IC1101 to pins 7, 8 and 9 of I.C.1102. This 3 bit code controls the operating modes of I.C.1102, e.g. read, write, erase, shift data etc. A clock control is fed to pin 6 for all operating mode requirements.

Once the desired station has been found and the tuning routine is stopped, IC1102 will store all information recieved at that moment. If that programme is then selected by pressing the buttons of the front control unit, then the 3 bit code required to operate IC1102 memory, is applied to pins 7, 8 and 9 from IC1101. As a result, data is passed from pin 12 of IC1102 to pin 13 of IC1101, which then outputs the required mark/space ratio needed from pin 20 to obtain the correct tuning voltage at the tuner terminal for that programme.

When the volume + or – key on the front control unit is pressed, a change in the mark/space ratio output from pin 19 of IC1101 will occur. This will alter the operating conditions of Q1110, and cause the collector voltage to rise or fall. This changing voltage is applied via R1183/R1186 to pin 13 of IC201, thus creating a rise or fall in volume level.

An internal clock oscillator is obtained for IC1101 operation by X1101, C1111/C1112 connected between pins 24 and 25.

At switch on IC1101 must be ready for operation; this is achieved by Q1102 and associated circuitry. As the 5V rail rises C1114 charges and Q1102 will conduct, pulling its collector low. This low is applied to pin 26 of IC1101 thus resetting the I.C.

When programme 11 or 12 is selected, the on screen display will indicate that the A.V. mode exists. These two positions can be used for external equipment such as V.C.R.s or home computers etc.

When in this mode, pin 14 of IC1101 will go low causing Q1103 to turn on, thus pulling its collector low. This is then applied to pin 11 of IC501 via R1176 and R704/R705, and will alter the internal horizontal stage time constant to suit V.C.R. operation.

The on-screen display is generated by IC1104. The initial position of the display is determined by the line and field pulses, which are input to pins 5 and 6 via R1119 and R1121. R1114 and C1120 control the internal oscillator stage of IC1104.

When a display function such as volume +/– or programme selection takes place, data is fed from IC1101 to pin 12 of IC1104 along with control signals which are applied to pins 13 and 14. An output is made available at pin 7 and is fed via L1106 then applied to the base of Q858 via R1139/R1141 and R871. Q858 will apply the on-screen display signal directly onto the green cathode of the C.R.T.

Tuning and Selection Circuit (Remote Models)
There are four I.C.s used on the remote models. IC1101 type M50432-551SP is the main control and selection I.C. and works in conjunction with the memory IC 1102 type M58655p. IC1104 is the on-screen display character generator type M50450-023p, and IC1201, type LA7224 receives then amplifies the commands from the remote control handset.

IC1201 is powered by the 5V supply obtained via D913/R913, ZD1151, and CP010 then applied to pin 8. When infra red light impinges on the photo diode D1201, the resultant current is applied to pin 7, and the amplified, shaped waveform is fed from pin 1. The gain of the I.C. is determined by the impedance of the tuned circuit on pin 3, and the series impedance of R1202/C1203 on pin 6. The tuned circuit of L1201/C1207 ensures maximum gain at the carrier frequency of 38kHz. The transmitted command information is filtered out by the action of C1205/R1207 on pin 2. The output from pin 1 of IC1201 is applied to the base of Q1201 via CP010, then input to IC1101 pin 15 for decoding.

IC1101 performs channel selection, search tuning, volume control etc. Which function is operated is determined by connecting one of the pins 1-4 to pins 6, 7, 8 or 10 via the appropriate switch and diode.

A 4MHz oscillator is applied between pins 33 and 34 which supplies a clock signal internally for all operating modes.

From switch on IC1101 must be brought out of its standby mode; this operation is performed by Q1102 and Q1103. When the mains switch is operated, a transient switch will connect R1169 to the cathode of D1102 in CP004. The diode will then conduct pulling Q1103 base low and briefly turning it on, connecting pin 2 to pin 38 and bringing the I.C. out of standby. As the 5V rail rises, C1101 will charge and turn Q1102 on, pulling pin 16 low thus resetting the IC to programme one. When the search tuning routine is initiated, the mark/space ratio output from pin 5 changes and is applied to Q1101 base via CP006.

The voltage at the collector of Q1101 will be chopped as the transistor turns on and off, and the resultant average voltage is then integrated and filtered by C1105/R1111, C1106/R1112 etc. This voltage is fed to the VT terminal of the tuner as the variable tuning voltage. Whilst this tuning is taking place, digital information is fed from pin 37 of IC1101 to pin 12 of IC1102, along with a 3 bit code from pins 6, 7, 8 of IC1101 to pins 7, 8 and 9 of IC1102. This 3 bit code controls the operating modes of IC1102 e.g. read, write, erase, shift data etc. A clock signal fed to pin 6 controls all the I.C. modes of operation.

Once the desired programme has been found and the search routine stopped, IC1102 will store all information received at that moment. If that programme is then selected by pressing the appropriate programme up/down button, the 3 bit code required to operate the memory is applied to pins 7, 8 and 9 of IC1102. As a result data is passed from pin 12 of IC1102 to pin 37 of IC1101, which outputs the required mark/space ratio needed at pin 5 to obtained the correct tuning voltage for that programme.

When operating the volume + or – keys, a change in the mark/space ratio output at pin 14 of IC1101 will be applied to the base of Q1108. This will alter the base drive conditions and therefore the voltage at the collector will vary. This variable D.C. voltage is fed to pin 13 of IC201 via R1138/D1115 and R1139, therefore controlling the audio output level of IC201.

Pressing colour up/down or brightness up/down keys will result in changes from pins 12 or 13, which are applied to IC501 pins 23 or 27 as control voltages.

When the V.T.R. mode is selected by the handset, pin 20 of IC1101 will become low and pin 29 will be high. The high at pin 29 is applied to the base of Q1105 and it will turn on pulling its collector low. This low is fed to pin 11 of IC501 and thus alters the internal line stages to suit V.C.R. operation.

The low output from pin 20 is fed to the junction of R1132A and CP011 therefore causing the base of Q1110 to go low, turning the transistor fully on. Approximately 12V is then fed via L1114 and applied to the anodes of D203 and D204. Both diodes will then conduct, applying high voltages to pins 4 and 14 of IC201, thus turning off the sound and vision I.F. stages for as long as the V.T.R. mode exists. This 12V is also used as the switching voltage to determine the mode of operation of the audio/video board.

A.F.C. tracking is performed by Q1106 and Q1107 stages. During tuning these transistors are both non-conducting, and the D.C. potential at the A.F.C. terminal of the tuner is held at approximately 7V by the potential dividers R206/R207.

Once a programme is set, should there be a drift in the tuning voltage, an output will be obtained from pin 24 of IC1101. This will then cause Q1106 to conduct, which will turn on Q1107, producing a corrective voltage at its collector, which will be applied to the A.F.C. terminal of the tuner. In this way the A.F.C. will track the tuning voltage and prevent any drift occuring.

IC1104 is the character display generator. It is driven by the 5V supply at pin 20 and gives an on screen display to indicate the search routine, programme number and volume level.

Line pulses are applied to pin 10 via R1131 and field pulses applied to pin 13 via R1130. These pulses are fed to an internal counter circuit which determines the position of the display on the screen. An internal oscillator is generated in conjunction with the external components R1154, C1119 and C1120.

When one of the display functions are operated, data is input from pin 10 of IC1101 to pin 17 of IC1104, along with control signals from IC1101 to pins 14, 15, 16 and 19 of IC1104.

Output signals are obtained from pins 5 and 6 then fed via L1112/R1148, L1113/R1147 to Q857 and Q858 on the C.R.T. base. The outputs at the collectors of these transistors are input to the Red and Green cathodes of the C.R.T. for display.

Audio/Video Board

This is used on the remote models only, and its purpose is to feed audio and video signals from an external source to the main chassis via the 7 pin din socket SK1301, as well as feeding audio and video signals from the chassis to the din socket. It also provides isolation. This board uses opto-couplers in transfering signals between the chassis and 7 pin din socket. These opto couplers, types TLP651 and TLP731 are designated IC1301, IC1302, IC1401, IC1402. The chassis heater pulse is applied to T1301, rectified by D1301 then smoothed by C1304 to give approximately 12V on the isolated side. This 12V supplies Q1301, Q1303, Q1314, Q1401, Q1402, Q1403 as well as being applied to the transmitting sides of IC1301/IC1401 and the receiving sides of IC1302/IC1402. The transmitting sides of IC1302/IC1402 are powered by the chassis 12V supply, while the receiving sides of IC1301/IC1401 are powered by a switching voltage which is only present during the V.T.R. modes.

When operating in T.V. mode, the video signal from the main chassis is fed to the base of emitter follower Q1323 and to Q1325 via C1326. From the emitter of Q1323 the video is returned to the main chassis via D1323, C1323, R1335 and emitter follower Q1324. The video applied to Q1325 is transmitted from the collector via opto-coupler IC1302, then further amplified by Q1303 before being input to pin 6 of the 7 pin din socket via emitter follower Q1314, C1305 and R1314.

The audio signal during T.V. mode is taken from the main chassis and applied to the bases of Q1423 and Q1424. The audio present at Q1423 emitter is returned to the main chassis at VA4, whilst the audio at the collector of Q1424 is transmitted by opto-coupler IC1402 to Q1402. Q1402 amplifies the audio, then inputs the signal to pins 1 + 4 of the 7 pin din socket via emitter follower Q1403, C1403 and R1411.

When the chassis is put into V.T.R. mode a switching voltage of approximately 12V is made available at VA1. This 12V is used to operate the video circuits consisting of Q1321/Q1322 and the receiving side of opto-coupler IC1301, and also powers the audio circuits of Q1421/Q1422 and the receiving side of IC1401 opto-coupler.

When in this V.T.R. mode, video is fed from pin 7 of the din socket to Q1301 base via C1301. The signal at Q1301 collector is transmitted by opto-coupler IC1301, fed to the base of Q1321 and amplified. It is then applied to emitter follower Q1332 via C1321, then input to the main chassis at VA6 via D1332, C1323, R1335 and emitter follower Q1324.

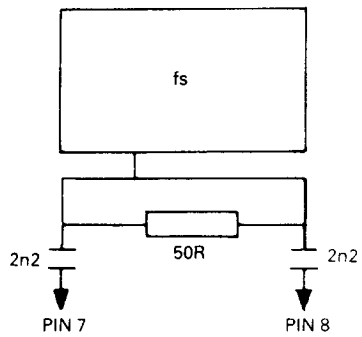
Audio signals in V.T.R. mode are fed from pins 3 + 5 of the din socket and applied to Q1401 base via C1401.

The audio is amplified by Q1401, transmitted to Q1421 by the opto-coupler IC1401, then fed to emitter follower Q1422 via C1421, R1431. From the emitter of Q1422 the audio is input to the main chassis at VA8 for further amplification and processing.

ALIGNMENT PROCEDURE

Sound I.F. Trap Adjustment

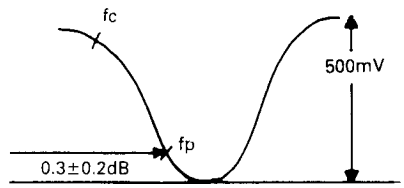
1. Apply the signal shown to I.C. 201. (Input level –30 ±5dBm).



2. Connect a 50 ohm resistor across L204 windings, and a 12V supply to pin 5 IC201.
3. Apply a variable voltage supply set at 4V to pin 4 of IC201, and an oscilloscope to TP203.
4. Gradually adjust the voltage to pin 4 and fix it at the position where the peak of the waveform on the scope is set to 500mV p.p.
5. Adjust L202 to minimise the output level.

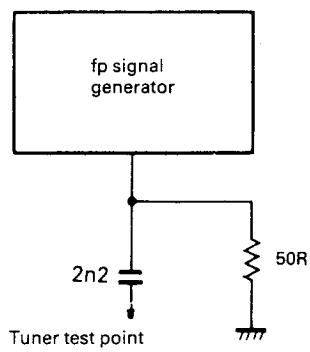
Carrier Filter Adjustment

1. Remove 50 ohm resistor from L204 windings.
2. Ensure peak of oscilloscope waveform is set to 500mV p.p. by adjusting voltage supply to pin 4 of IC201.
3. Adjust core of L204 so that fp is 0.3 ± 0.2dB from the peak of waveform.

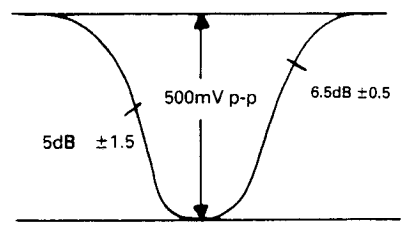


I.F. Adjustment

1. Input a signal level of –40 ±5dBm to tuner test point.

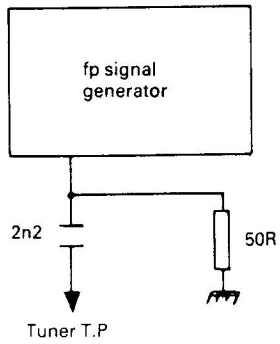


2. Connect an oscilloscope to TP203 and a 50 ohm resistor across windings of L204.
3. Apply 12V to the BM terminal of the tuner, 15V to the VT terminal and 0V to pin 4 terminal of the tuner.
4. Apply a variable voltage to pin 4 IC201 and set it so the scope waveform is set to 500 mV p.p.
5. Turn the core of the tuner IFT to set the waveform to the specifications below.



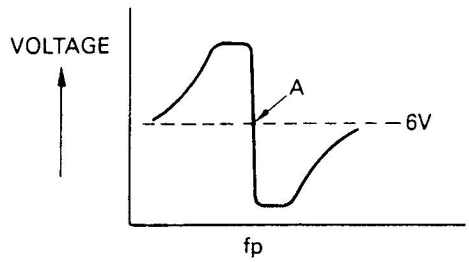
AFC Adjustment

1. Input a 40% A.M. modulation signal as shown to tuner test point (modulation frequency 15.625kHz, Signal level -30 ±5dBm)



2. Connect a digital meter to TP202, and a 12V supply to pin 5 IC201.
3. Connect a 100 ohm resistor to ground from the base of Q204 (manual models) or Q1106 (Remote models).
4. Adjust L203 to set digital voltmeter reading to 6V ± 0V5.

NOTE: The AFC characteristics are shown below and the 6V point of this adjustment refers to point A on the S curve i.e. the rapidly changing voltage.



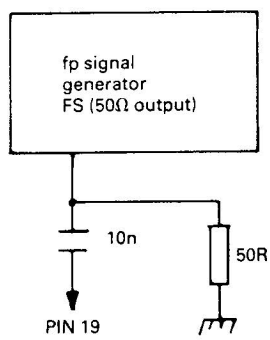
A.G.C. Adjustment

1. Allow set to warm up for at least 2 minutes, then apply a voltmeter to TP201.
2. Measure the voltage under no signal conditions and ensure it is approximately 8V0.
3. Apply a test signal of approximately –47dB and turn AFC switch off.
4. Adjust R210 so voltage reads 5V ±0V3.

Sound I.F. Alignment

1. Connect a standard FM signal generator to I.C. 201 pin 19 as shown.

Carrier frequency 6 MHz ±5kHz
Modulation frequency 400 Hz
Modulation F.M. 50% (25kHz)
Output level –50dBm

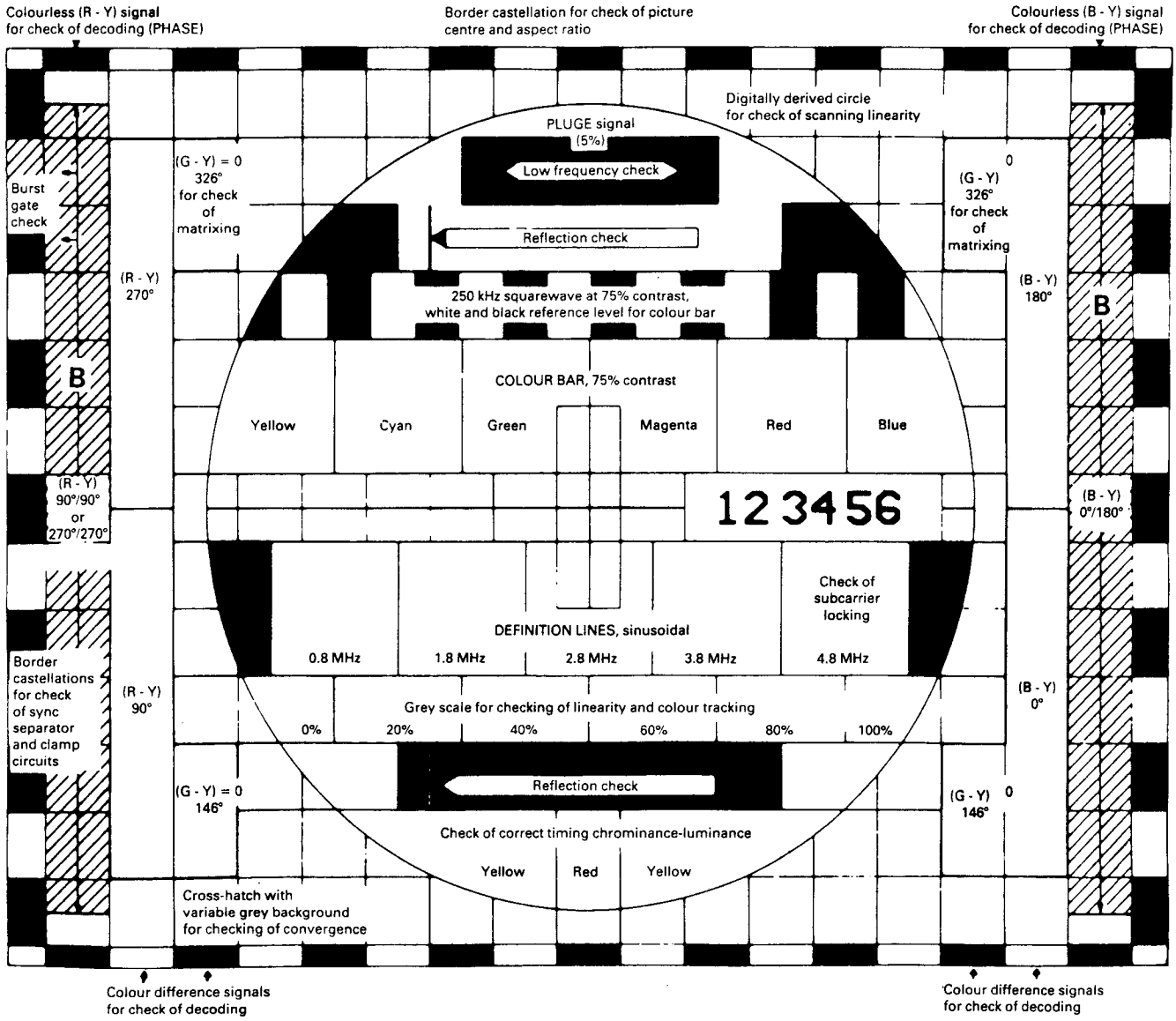


2. Apply 12V to pin 5 of IC201 and 7V to pin 4 and connect a high impedance meter to the junction of R406/C408.
3. Adjust L402 so reading of voltmeter is set to maximum level.

COLOUR ALIGNMENT

1. Receive philips pattern or other suitable signal.
2. Set colour, brightness and contrast controls to normal viewing levels.
3. Adjust L503 to minimise colour in section B of Pattern drawing.
4. Adjust R510 for minimum venetian blind in B areas of pattern, then adjust T501 to minimum venetian blind on the magenta area of colour bar portion of pattern.
5. Repeat step 4 to achieve best overall result.

COMPOSITION OF TEST CARD PROVIDED BY PHILIPS PM 5544


Colourless (R - Y) signal for check of decoding (PHASE)
Border castellation for check of picture centre and aspect ratio
Colourless (B - Y) signal for check of decoding (PHASE)
Digitally derived circle for check of scanning linearity
PLUGE signal (5%)
Low frequency check
Reflection check
250 kHz squarewave at 75% contrast, white and black reference level for colour bar
COLOUR BAR, 75% contrast
Yellow
Cyan
Green
Magenta
Red
Blue
12 3456
DEFINITION LINES, sinusoidal
0.8 MHz
1.8 MHz
2.8 MHz
3.8 MHz
4.8 MHz
Check of subcarrier locking
Grey scale for checking of linearity and colour tracking
0%
20%
40%
60%
80%
100%
Reflection check
Check of correct timing chrominance-luminance
Yellow
Red
Yellow
Cross-hatch with variable grey background for checking of convergence
Burst gate check
(G - Y) = 0 326° for check of matrixing
(R - Y) 270°
(R - Y) 90°/90° or 270°/270°
(R - Y) 90°
(G - Y) = 0 146°
Border castellations for check of sync separator and clamp circuits
0 (G - Y) 326° for check of matrixing
(B - Y) 180°
(B - Y) 0°/180°
(B - Y) 0°
0 (G - Y) 146°
B
B
Colour difference signals for check of decoding
Colour difference signals for check of decoding

HORIZONTAL ADJUSTMENT

1. Receive the Philips pattern or suitable signal, and set brightness and contrast controls to maximum.
2. Adjust R710 to position the left and right hand side of the picture symmetrically.

VERTICAL AMPLITUDE

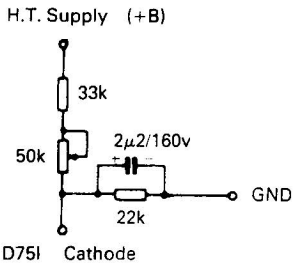
1. Leave set warm up for approximately 5 minutes.
2. Receive the philips pattern and set brightness and contrast to maximum.
3. Connect the V. CENT flying lead to one of the pins "U", "N" or "D" till the best centralised picture is obtained.
4. Adjust R623 to obtain the desired height.

FOCUS ADJUSTMENT

1. Receive Philips test pattern.
2. Set colour control to minimum, and set brightness and contrast controls to achieve normal viewing levels.
3. Gradually adjust the focus control on the Flyback transformer so the centre vertical line is brought into focus.

HIGH VOLTAGE PROTECTION CHECK

1. Set up Test Jig as shown below with variable control at maximum.



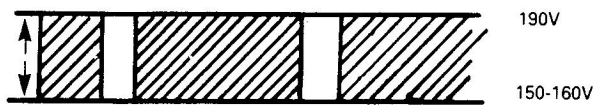
2. Set brightness and contrast controls to maximum, and connect a D.C. voltmeter between D751 cathode and ground.
3. Gradually decrease the resistance of the variable resistor and confirm that sound and raster disappear at an average reading 24V6 (25V3MAX).
4. Switch set off and disconnect test jig. After approximately 10 seconds switch set on again to ensure correct operation.

ANODE/FOCUS SHORT CIRCUIT TEST

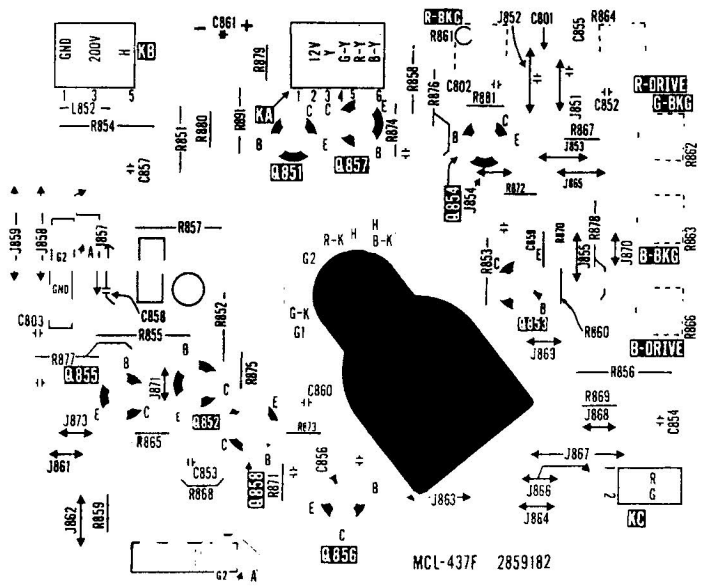
1. Switch set on and turn brightness and contrast to maximum.
2. Connect a 3k3 resistor between the 12V supply (Q791 emitter) and the cathode of ZD753.
3. Confirm that sound and raster disappear immediately.
4. Switch set off, remove resistor, and after a delay of 10-15 seconds switch on again to confirm circuit operates correctly.

GREY SCALE SETTING PROCEDURE

1. Set background controls R861, R862, R863 to their minimum setting.
2. Set the drive controls R864, R866 to their mechanical centre, and turn the screen control on the flyback transformer fully counter clockwise.
3. Adjust the brightness, contrast and picture control to minimum.
4. Receive the white pattern signal (100% white), then connect TP3 to TP4, and TP4 to TP5 to collapse vertical scan.
5. Connect an oscilloscope to the red, green and blue cathodes individually and confirm the voltage level shown in diagram.



6. Turn the screen control gradually clockwise until a red, green or blue line just appears, then adjust the background controls of the other two colours until they also just appear.
7. Disconnect the short circuit between TP3, TP4 and TP5 to restore vertical scan.
8. Adjust brightness control so that the white raster just appears, and if the low light balance needs to be corrected, then adjust the two background controls used in step 6.
9. Adjust brightness control to maximum and check the high light balance. If correction is required then adjust the two drive controls R864, R866.

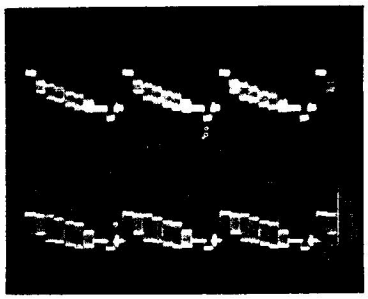


P.C.B. OF C.R.T. BASE
PRINT SIDE

WAVEFORMS FOR G6P CHASSIS. TAKEN ON COLOURS BARS WITH 10:1 PROBE WITH BRILL, CONT, AND COLOUR AT MAXIMUM. ALL WAVEFORMS TAKEN ON 20μ SEC/CM UNLESS STATED OTHERWISE.

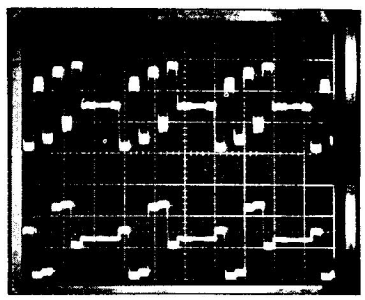
PIN 18 + 30
IC201
3v p.p.

Q202 EMITTER
1v p.p.



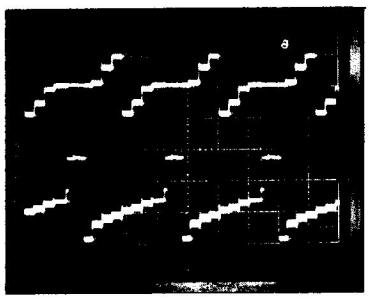
PIN 1 IC501
6v p.p.

PIN 2 IC501
5v p.p.



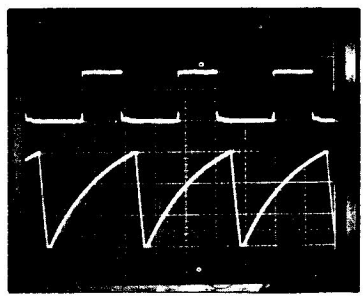
PIN 3 IC501
4v p.p.

PIN 4 IC501
5v5 p.p.



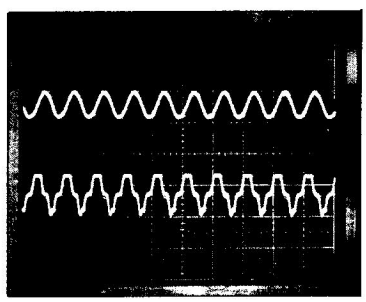
PIN 7 IC501
1v6 p.p.

PIN 8 IC501
6v p.p.

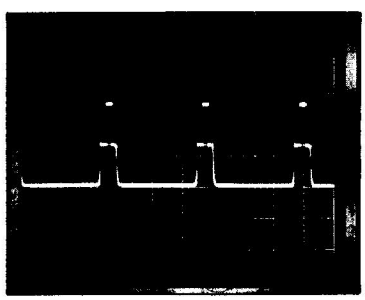


PIN 12 IC501
1v p.p. at 2μ secs/cm

PIN 13 IC501
1v4 p.p. at 2μ secs/cm

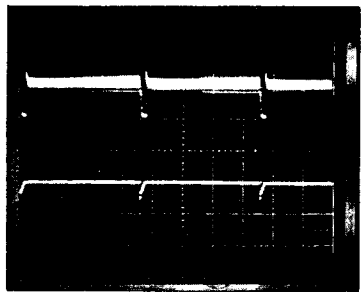


PIN 14 IC501
14v p.p. at 5m secs/cm.

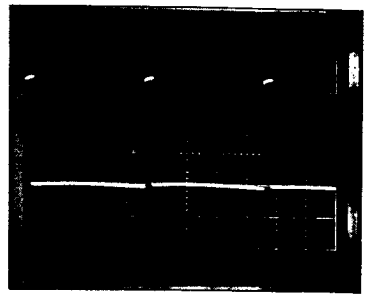


PIN 15 IC501
1v5 p.p. at 5m secs/cm.

PIN 16 IC501
3v p.p. at 5m secs/cm.

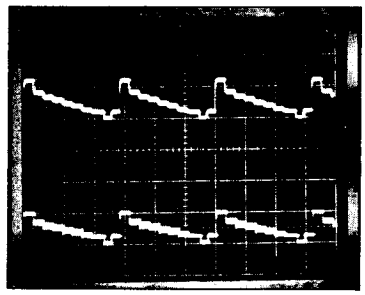


PIN 17 IC501
7v p.p. at 5m secs/cm.



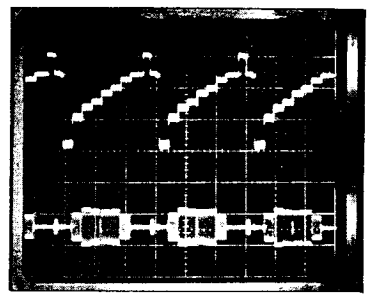
PIN 18 IC501
1v4 p.p.

PIN 21 IC501
0v5 p.p.



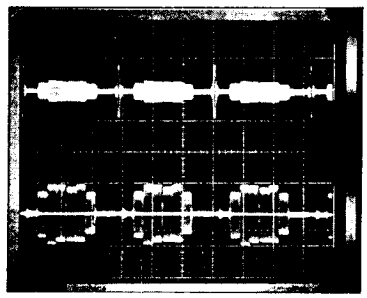
PIN 23 IC501
3v p.p.

PIN 26 IC501
0v6 p.p.



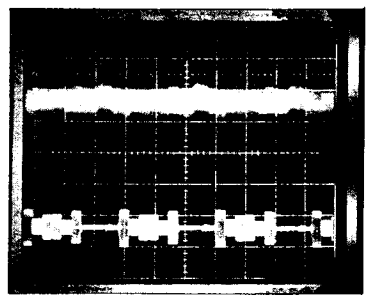
PIN 28 IC501
0v9 p.p.

PIN 29 IC501
4v p.p.

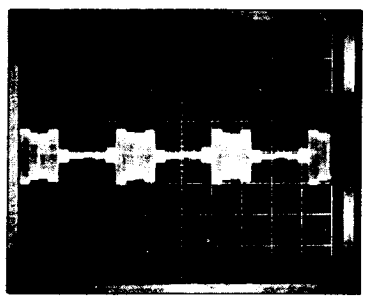


PIN 31 IC501
0v3 p.p.

PIN 35 IC501
0v6 p.p.

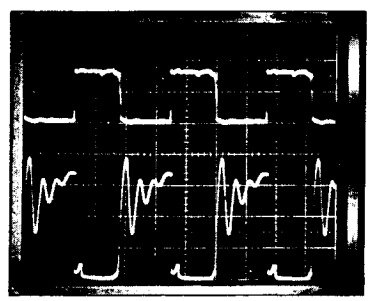


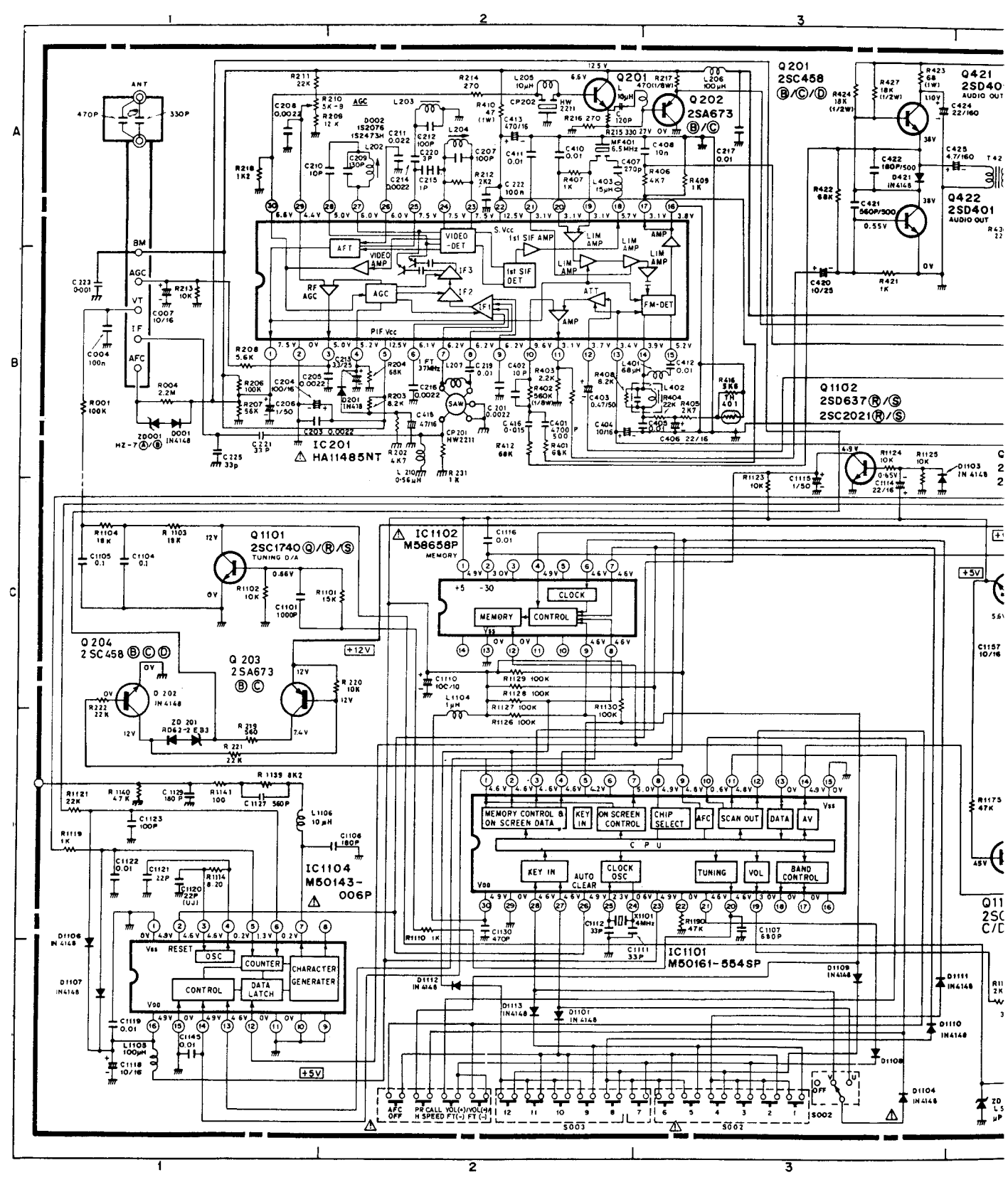
PIN 36 IC501
0v9 p.p.

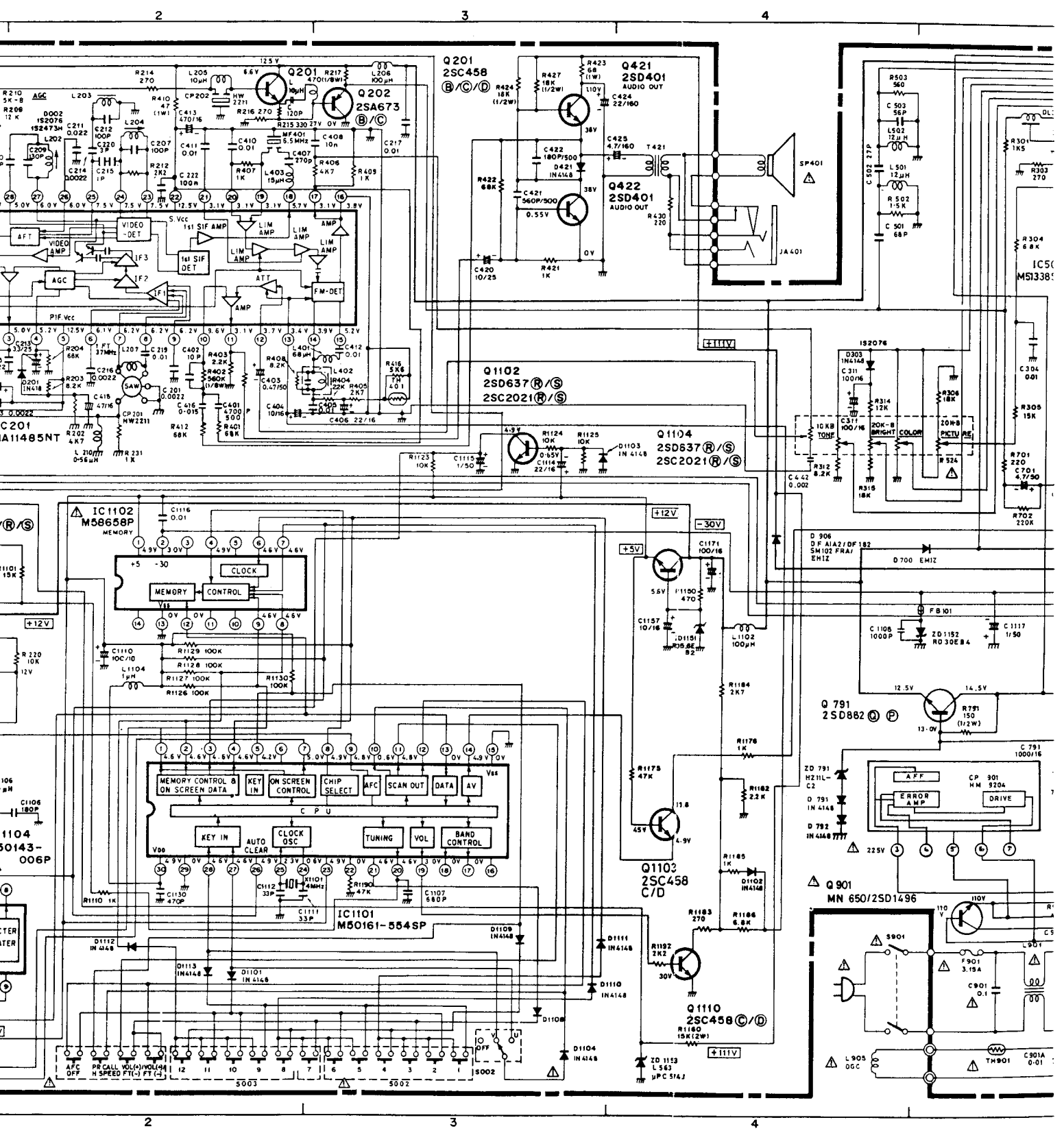


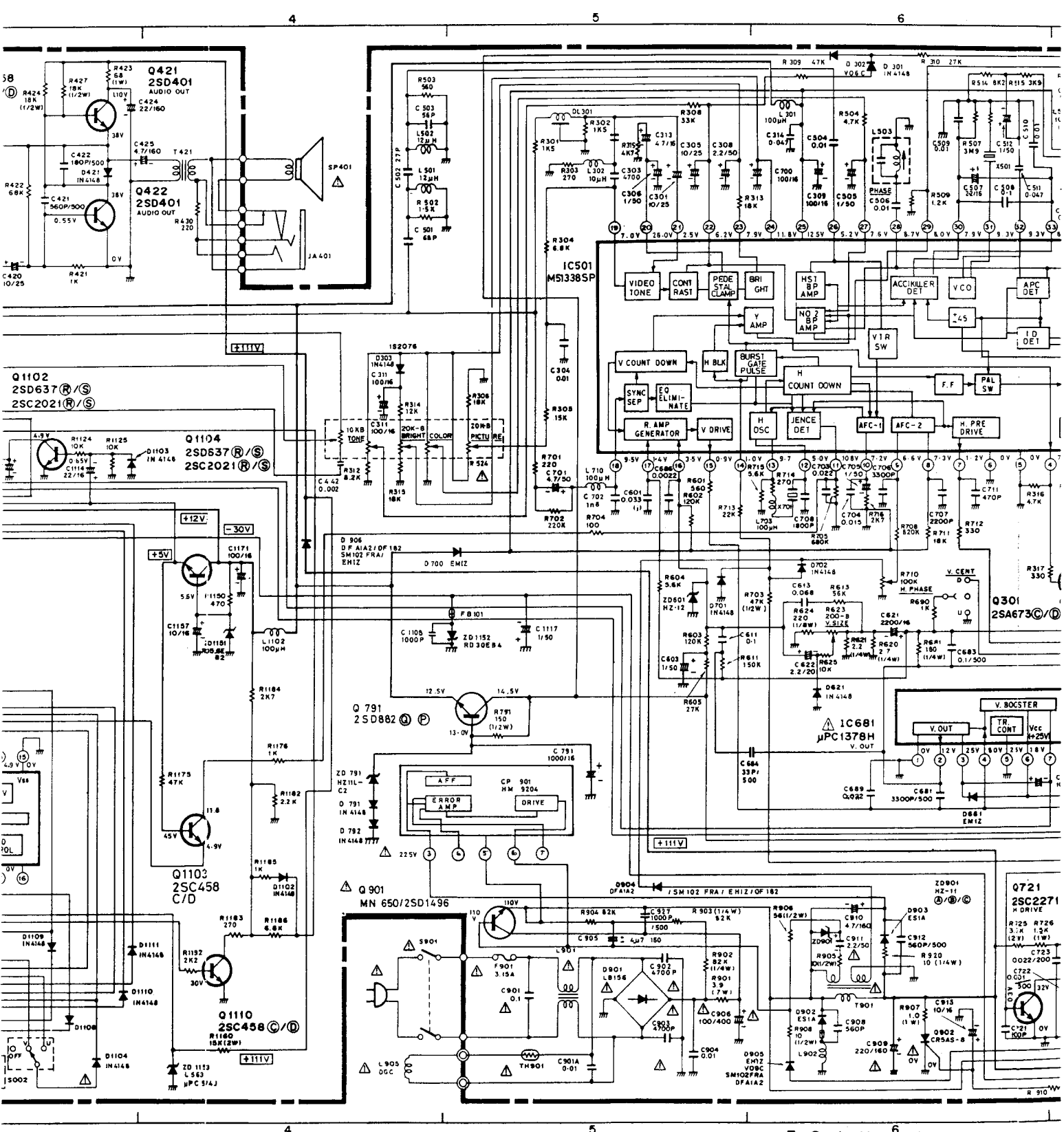
Q721 BASE
0v8 p.p.

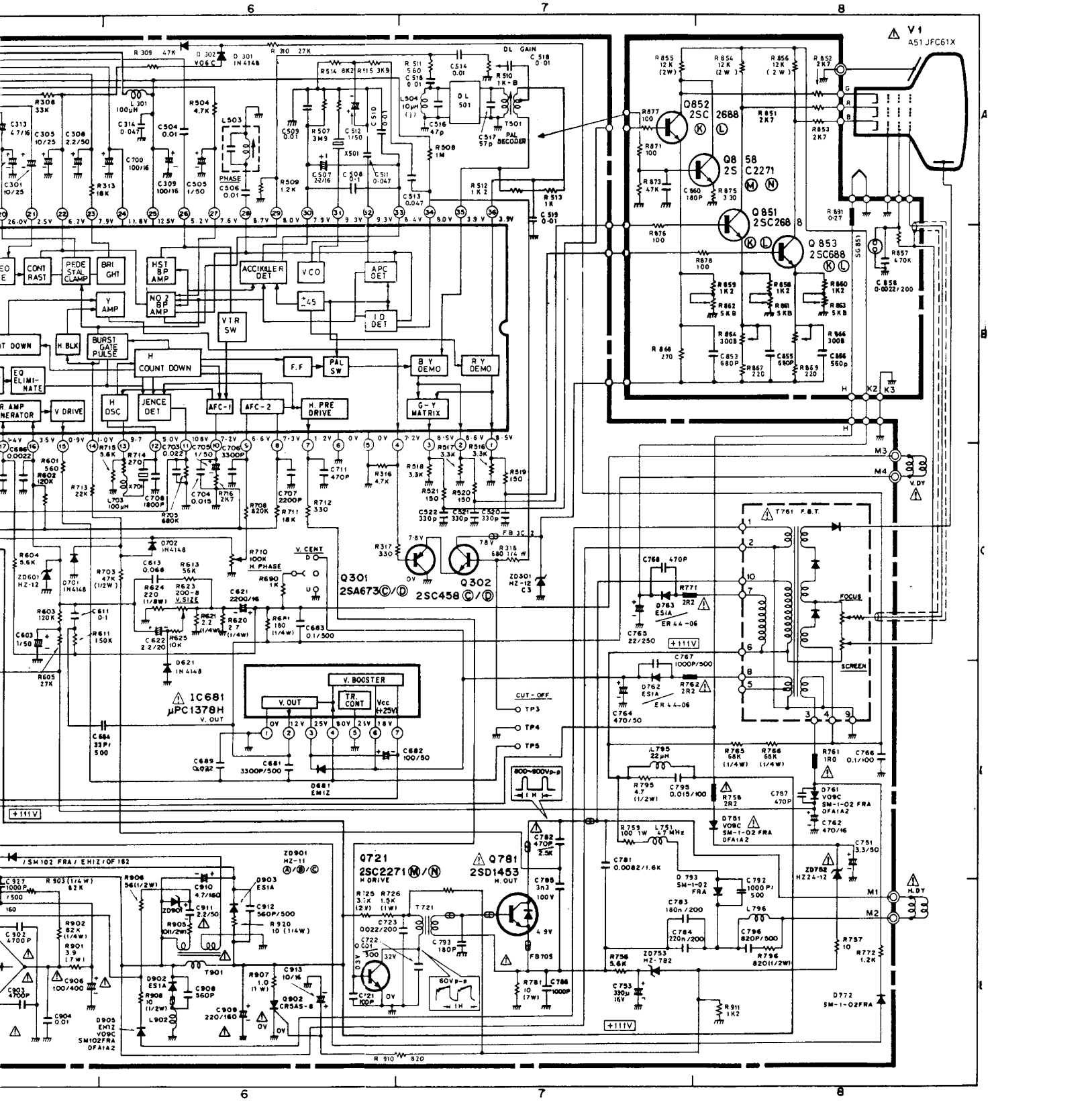
Q721 COLLECTOR
40v p.p.

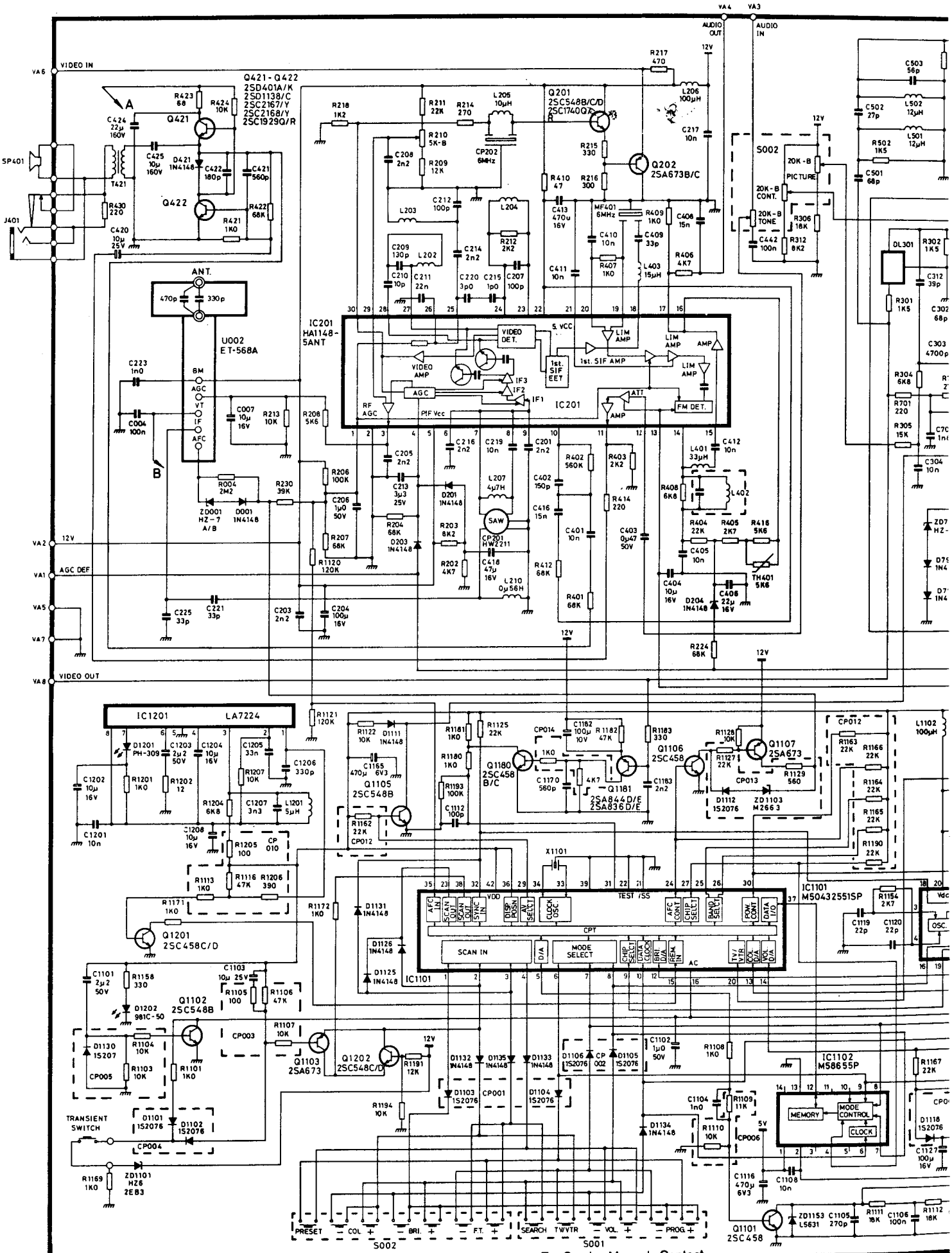



ANT
470P
330P
BM
AGC
VT
IF
AFC
IC201
HA11485NT
IC1102
M58658P
MEMORY
IC1104
M50143-006P
IC1101
M50161-554SP
Q1101
2SC1740 Q/R/S
TUNING D/A
Q201
2SC458 B/C/D
Q202
2SA673 B/C
Q204
2SC458 B C D
Q203
2SA673 B C
Q421
2SD40
AUDIO OUT
Q422
2SD401
AUDIO OUT
Q1102
2SD637 R/S
2SC2021 R/S
CLOCK
MEMORY
CONTROL
MEMORY CONTROL & ON SCREEN DATA
KEY IN
ON SCREEN CONTROL
CHIP SELECT
AFC
SCAN OUT
DATA
AV
C P U
KEY IN
AUTO CLEAR
CLOCK OSC
TUNING
VOL
BAND CONTROL
RESET
OSC
COUNTER
CHARACTER GENERATOR
CONTROL
DATA LATCH
VIDEO -DET
VIDEO AMP
AFT
RF AGC
AGC
1st SIF DET
LIM AMP
FM-DET
ATT
PIF Vcc
S Vcc
+12V
+5V
+5
-30
AFC OFF
PR CALL
H SPEED
VOL(+)/FT(-)
VOL(-)/FT(-)
S003
S002
OFF

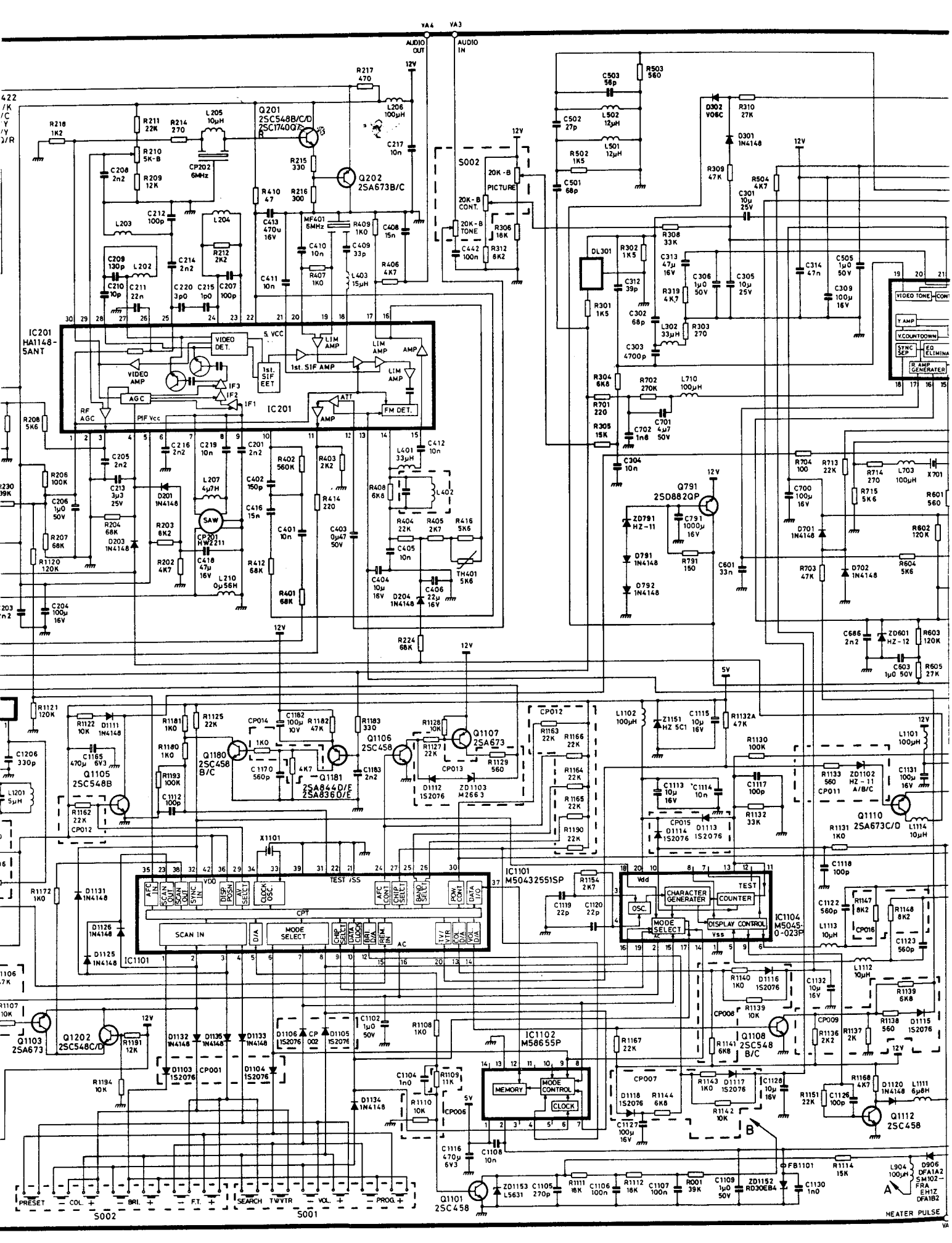

Q201
2SC458
B/C/D
Q202
2SA673
B/C
Q421
2SD401
AUDIO OUT
Q422
2SD401
AUDIO OUT
SP401
JA401
Q1102
2SD637 R/S
2SC2021 R/S
Q1104
2SD637 R/S
2SC2021 R/S
IC1102
M58658P
MEMORY
CLOCK
MEMORY
CONTROL
IC1101
M50161-554SP
MEMORY CONTROL & ON SCREEN DATA
KEY IN
ON SCREEN CONTROL
CHIP SELECT
AFC
SCAN OUT
DATA
AV
C P U
KEY IN
AUTO CLEAR
CLOCK OSC
TUNING
VOL
BAND CONTROL
Q1103
2SC458
C/D
Q1110
2SC458 C/D
Q 791
2SD882 Q P
Q 901
MN 650/2SD1496
IS2076
TONE
BRIGHT
COLOR
PICTURE
VIDEO DET
1st SIF AMP
LIM AMP
FM-DET
AGC
AFT
VIDEO AMP
ATT
IF1
IF2
IF3
SAW
S002
S003
S002
+111V
+12V
-30V
+5V

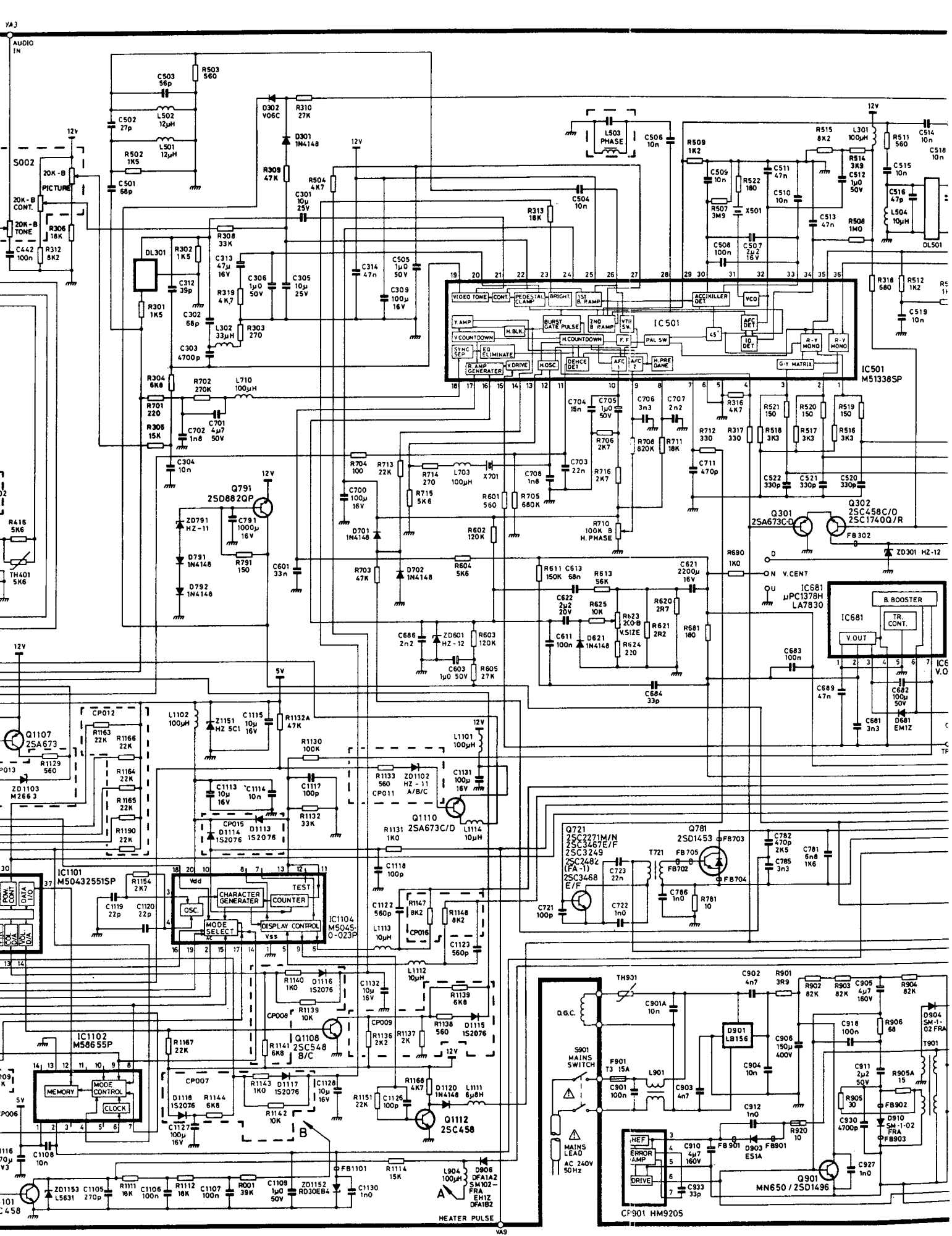

Q421
2SD401
AUDIO OUT
Q422
2SD401
AUDIO OUT
SP401
JA401
IC501
M51338SP
VIDEO TONE
CONT RAST
PEDE STAL CLAMP
BRI GHT
HS1 BP AMP
NO2 BP AMP
ACCIKILLER DET
VCO
APC DET
Y AMP
V1R SW
I D DET
V COUNT DOWN
H BLK
BURST GATE PULSE
H COUNT DOWN
F.F
PAL SW
SYNC SEP
EQ ELIMI-NATE
R. AMP GENERATOR
V DRIVE
H OSC
JENCE DET
AFC-1
AFC-2
H. PRE DRIVE
Q1102
2SD637Ⓡ/Ⓢ
2SC2021Ⓡ/Ⓢ
Q1104
2SD637Ⓡ/Ⓢ
2SC2021Ⓡ/Ⓢ
+111V
+12V
-30V
+5V
Q791
2SD882Ⓠ Ⓟ
1C681
μPC1378H
V. BOOSTER
V. OUT
TR. CONT
Vcc +25V
Q301
2SA673Ⓒ/Ⓓ
Q1103
2SC458
C/D
Q1110
2SC458Ⓒ/Ⓓ
Q901
MN 650/2SD1496
Q721
2SC2271
H DRIVE
ERROR AMP
DRIVE
AFF
CP 901
HW 9204
TH901
F901
3.15A
S901

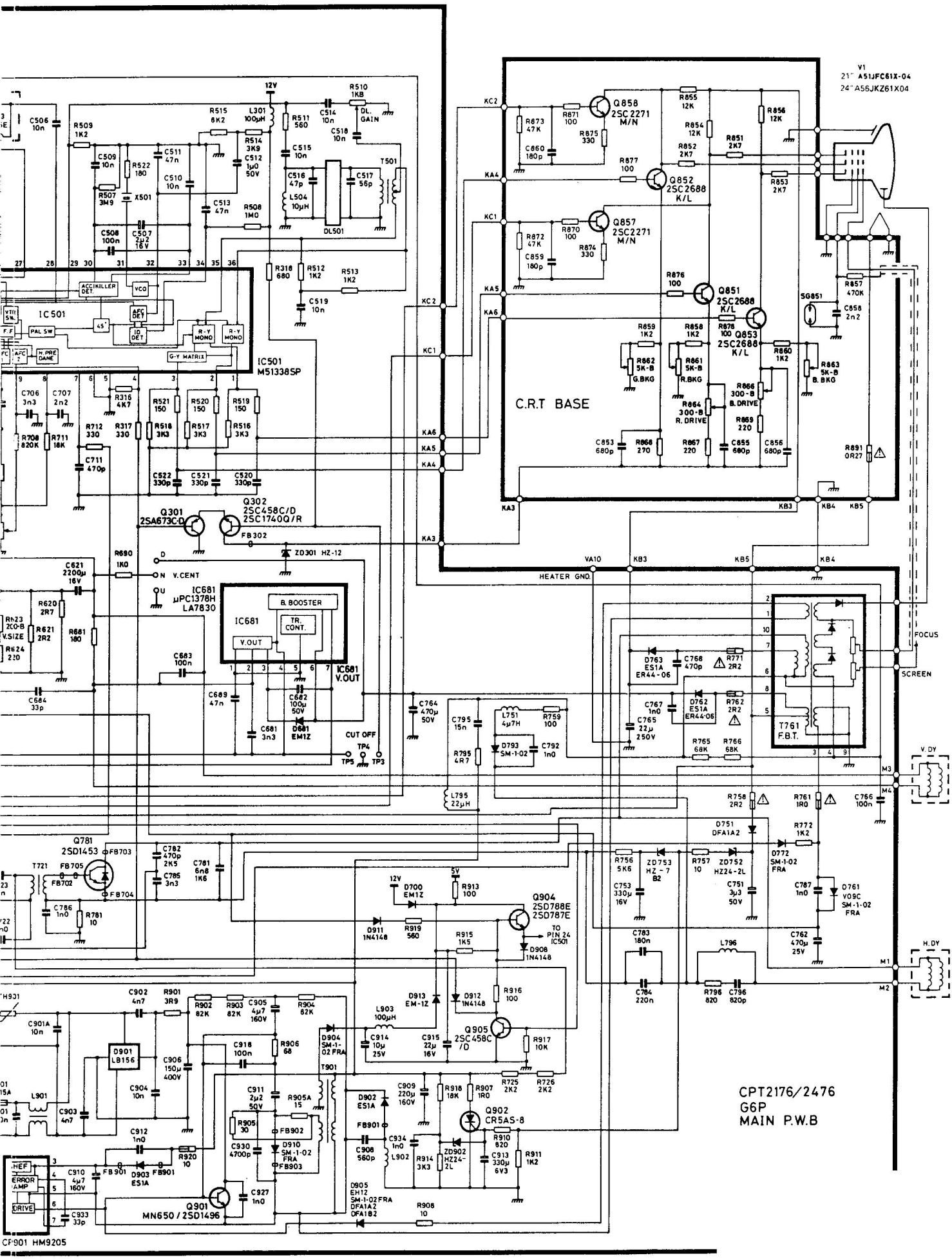

V1
A51 JFC61X
Q852 2SC 2688
Q8 58 2S C2271
Q851 2SC268 8
Q 853 2SC688
DL GAIN
PAL DECODER
PHASE
H COUNT DOWN
V BOOSTER
V. OUT
TR. CONT
Vcc (+25V)
μPC1378H
V. OUT
Q301 2SA673Ⓒ/Ⓓ
Q302 2SC458Ⓒ/Ⓓ
Q721 2SC2271Ⓜ/Ⓝ
H DRIVE
Q781 2SD1453
H. OUT
T761 F.B.T.
FOCUS
SCREEN
V. CENT
H. PHASE
V. SIZE
CUT-OFF
TP3
TP4
TP5
+111V
H.DY
V.DY
M1
M2
M3
M4
K2
K3

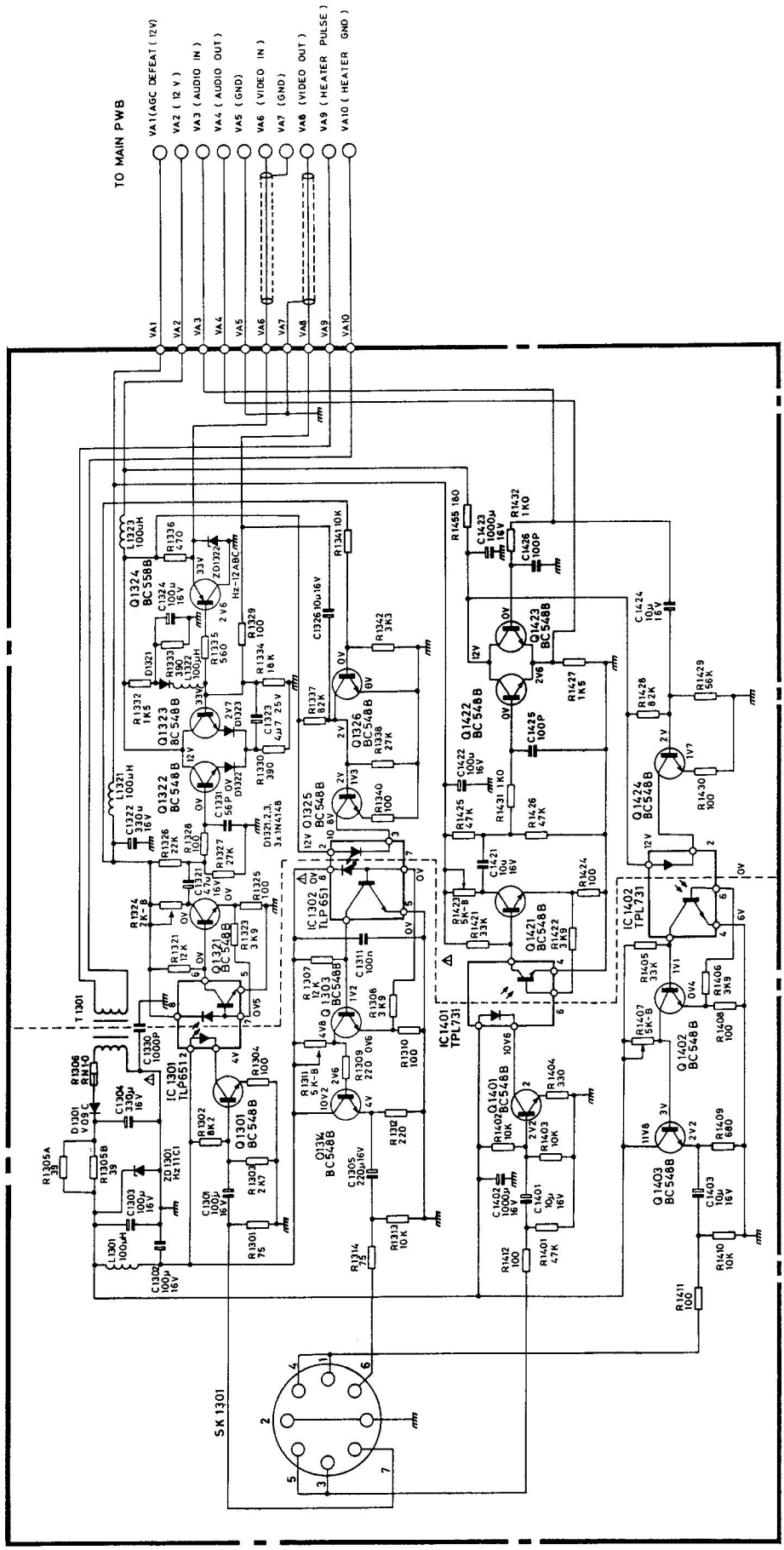


For Service Manuals Contact

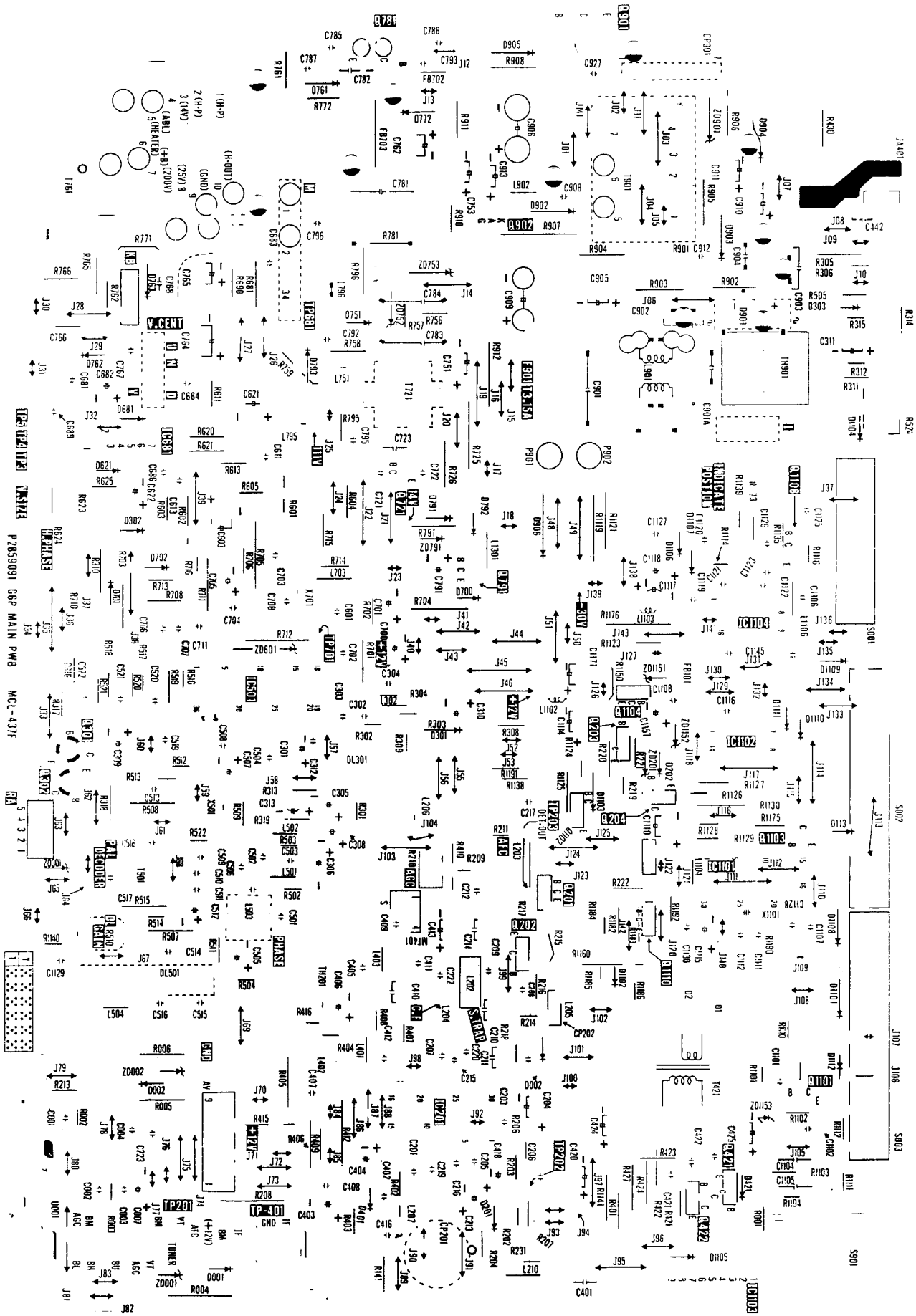

VA4
VA3
AUDIO OUT
AUDIO IN
12V
5V
Q201 2SC548B/C/D 2SC1740 R
Q202 2SA673B/C
IC201 HA1148-5ANT
VIDEO DET.
VIDEO AMP
AGC
RF AGC
PIF Vcc
5. VCC
LIM AMP
1st. SIF AMP
1st. SIF EET
FM DET.
ATT
IF1
IF2
IF3
S002
20K-B PICTURE
20K-B CONT.
20K-B TONE
Q791 2SD882QP
ZD791 HZ-11
ZD601 HZ-12
Q1105 2SC548B
Q1180 2SC458 B/C
Q1106 2SC458
Q1107 2SA673
Q1181 2SA844D/E 2SA836D/E
ZD1103 M266 3
D1112 1S2076
X1101
IC1101 M50432551SP
TEST
VDD
VSS
SCAN IN
MODE SELECT
D/A
CPT
IC1104 M5045-023P
CHARACTER GENERATOR
COUNTER
DISPLAY CONTROL
OSC.
Q1110 2SA673C/D
Q1103 2SA673
Q1202 2SC548C/D
IC1102 M58655P
MEMORY
CLOCK
Q1108 2SC548 B/C
Q1112 2SC458
Q1101 2SC458
PRESET
COL.
BRI.
F.T.
SEARCH
TV/VTR
VOL.
PROG.
S002
S001
HEATER PULSE


AUDIO IN
IC501 M51338SP
IC1101 M50432551SP
IC1102 M58655P
IC1104 M5045-0-023P
IC681 µPC1378H LA7830
Q791 2SD882QP
Q1107 2SA673
Q1110 2SA673C/D
Q1108 2SC548 B/C
Q1112 2SC458
Q301 2SA673C-D
Q302 2SC458C/D 2SC1740Q/R
Q721 2SC2271M/N 2SC3467E/F 2SC3249 2SC2482 (FA-1) 2SC3468 E/F
Q781 2SD1453
Q901 MN650 / 2SD1496
D901 LB156
IC901 HM9205
PICTURE
PHASE
V.CENT
V.SIZE
H. PHASE
MAINS SWITCH
MAINS LEAD
AC 240V 50Hz
HEATER PULSE
VA3
VA9

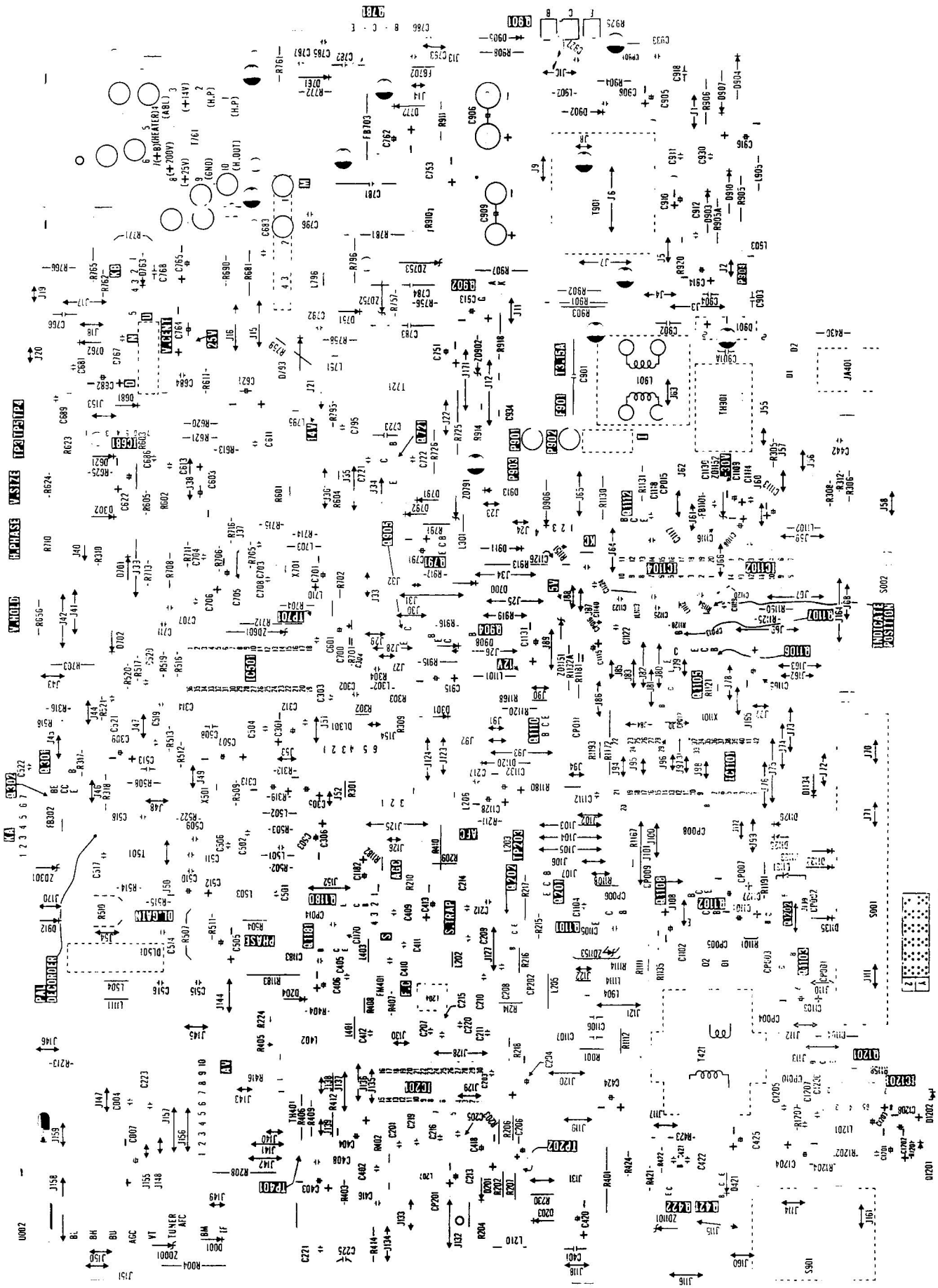

V1
21" A51JFC61X-04
24" A56JKZ61X04
IC501
M51338SP
C.R.T BASE
Q858 2SC2271 M/N
Q852 2SC2688 K/L
Q857 2SC2271 M/N
Q851 2SC2688 K/L
Q853 2SC2688 K/L
Q301 2SA673C-D
Q302 2SC458C/D 2SC1740Q/R
IC681 μPC1378H LA7830
B. BOOSTER
TR. CONT.
V.OUT
IC681 V.OUT
HEATER GND.
FOCUS
SCREEN
T761 F.B.T.
V. DY
H. DY
CUT OFF
Q781 2SD1453
Q904 2SD788E 2SD787E
Q905 2SC458C /D
Q902 CR5AS-8
Q901 MN650 / 2SD1496
D901 LB156
T901
T721
L901
L903 100μH
L795 22μH
L796
CPT2176/2476
G6P
MAIN P.W.B
CF901 HM9205



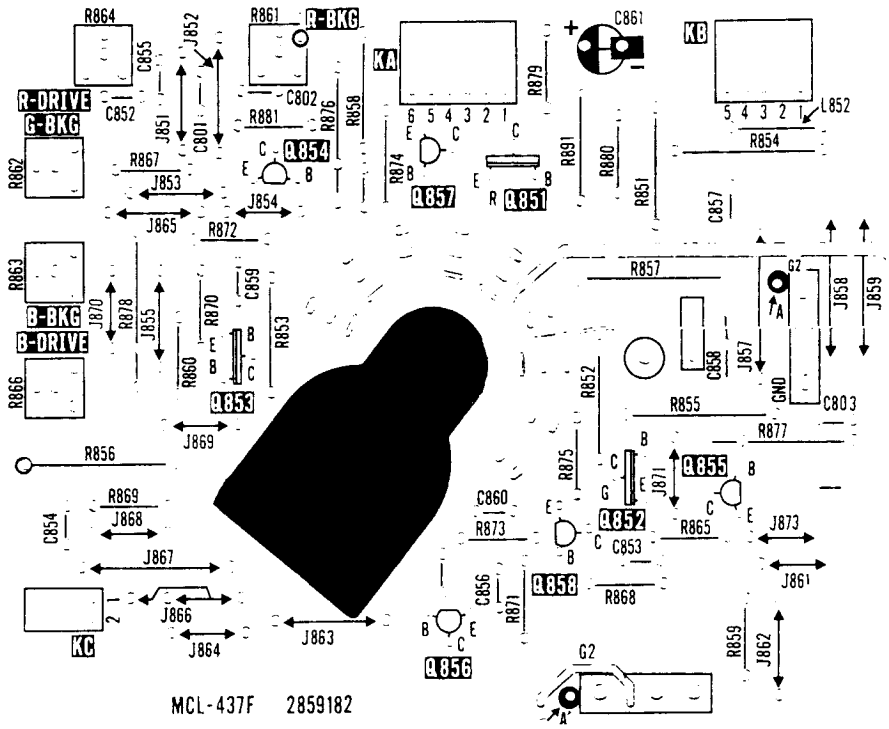
A.V. CIRCUIT FOR CPT 21/2476



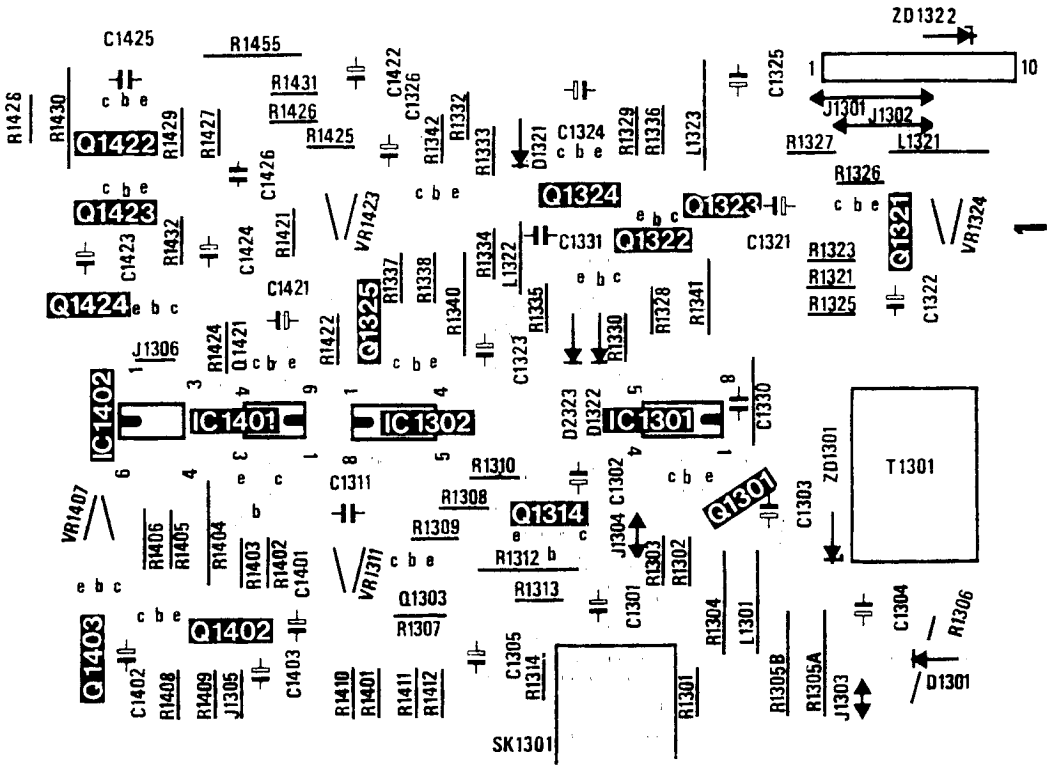
MAIN P.C.B. CPT 2174
PRINT SIDE



MAIN P.C.B. CPT 21/2476
PRINT SIDE



C.R.T. BASE COMPONENT SIDE



A.V. BOARD PRINT SIDE

VOLTAGE TABLES

TAKEN ON COLOUR BARS WITH BRIGHTNESS, CONTRAST, AND COLOUR SET TO MAXIMUM 20kΩ/VOLT METER USED (AV08).

IC201 HA11485			
Pin	**Volts**	**Pin**	**Volts**
1	7V2	16	3V7
2	0V	17	3V1
3	7V6	18	5V8
4	5V2	19	2V9
5	12V5	20	2V9
6	6V1	21	2V9
7	6V1	22	11V5
8	6V1	23	7V5
9	6V1	24	7V5
10	9V4	25	5V7
11	3V6	26	0V
12	3V6	27	5V0
13	1V0 (min volume)	28	5V0
14	3V9	29	4V3
15	5V2	30	6V5

Variations on remote models in video mode.
Pin 3 0V Pin 4 12V
Pin 18 7V3 Pin 30 8V4.

IC501 HA51338SP			
Pin	**Volts**	**Pin**	**Volts**
1	8V6	19	6V8
2	8V6	20	2V8
3	8V6	21	1V3
4	7V2	22	6V3
5	0V	23	7V9
6	0V	24	11V8
7	0V5	25	12V5
8	7V2	26	4V5
9	5V5	27	8V5
10	5V9	28	8V7
11	6V0	29	8V1
12	5V0	30	6V7
13	9V8	31	9V3
14	1V0	32	9V3
15	0V9	33	8V3
16	3V5	34	6V3
17	1V3	35	3V9
18	9V5	36	3V9

Pin 11 0V in Video Mode.

IC601 μPC1378H			
Pin	**Volts**	**Pin**	**Volts**
1	0V	5	0V
2	12V	6	25V
3	25V	7	2V2
4	0V8		

IC901 HM9205	
Pin	**Volts**
3	220V
4	Not used
5	110V
6	110V
7	Not used

			Manual Models Only									
	Q201	**Q202**	**Q203**	**Q204**	**Q301**	**Q302**	**Q421**	**Q422**	**Q721**	**Q781**	**Q791**	**Q901**
E	5V8	3V3	12V5(12V5)	0V(0V)	7V3	7V3	40V	0V	0V	5V8	12V5	110V
B	6V4	2V5	12V3(11V6)	0V(0V7)	7V1	8V0	40V	0V5	0V3	5V8	13V	110V
C	12V5	0V	8V0(12V)	12V(0V1)	0V	7V3	108V	40V	32V	110V	15V	320V

Bracket Voltages
Indicate AFC off

			Remote Models Only	
	Q902		**Q904**	**Q905**
K	0V	E	11V5(0V)	0V(0V)
G	0V	B	12V5(0V5)	0V(0V7)
A	110	C	11V8(8V2)	12V5(0V)

Bracketed Voltages indicate
stand by mode

TUNING & CONTROL CIRCUIT VOLTAGE FOR MANUAL MODELS.

IC1101 M50161					
Pin	**Volts**	**Variations**	**Pin**	**Volts**	**Variations**
1	4V6		16	Not used	
2	4V6		17	Not used	
3	4V6		18	Not used	
4	4V2		19	4V5	0V at max. vol.
5	3V3	1V5 when recall button held on	20	Varies with tuning	
6	Not used		21	4V1	
7	5V0		22	0V	
8	4V9		23	5V0	
9	0V	4V8 AFC off	24	0V7 (10V Range)	
10	0V5		25	2V3	
11	4V8		26	4V8	
12	4V6		27	4V2	
13	—	0V or 5V depends on function selected.	28	4V2	
14	4V9		29	0V	
15	0V		30	5V0	

IC1102 M58658P			
Pin	**Volts**	**Pin**	**Volts**
1	5V0	8	4V6
2	−30V	9	4V6
3	Not used	10	Not used
4	4V9	11	Not used
5	Not used	12	0V or 5V0 See pin 13 IC1101
6	4V2	13	0V
7	4V6	14	Not used

IC1104 M50143			
Pin	**Volts**	**Pin**	**Volts**
1	0V	9	0V
2	4V9	10	0V
3	0V	11	0V
4	0V	12	0V or 5V2 see pin 13 IC1101
5	1V5	13	4V6
6	0V3	14	5V0
7	0V	15	0V
8	Not used	16	5V0

	Q1101	Q1102	Q1103	Q1104	Q1110
E	0V	0V	5V0	5V0	0V
B	Varies with tuning	0V	4V0	5V6	Varies with vol.
C	Varies with tuning	4V9	6V0	12V5	Varies with vol.

C.R.T. BASE VOLTAGES (MANUAL & REMOTE MODELS).

	Q851	Q852	Q853	Q858	Q857 (Remote only)
E	8V0	8V0	8V0	0V	0V
B	8V5	8V5	8V5	0V	0VC
C	155V	155V	155V	155V	155V

TUNING & CONTROL CIRCUIT VOLTAGE FOR REMOTE MODELS.

IC1101 M50432					
Pin	**Volts**	**Variations**	**Pin**	**Volts**	**Variations**
1	4V8		22	0V	
2	5V1		23	4V8	
3	4V8		24	0V8	
4	4V8		25	0V	
5	4V8	varies with programme number	26	0V6	
6	5V1		27	4V8	
7	5V1		28	Not used	
8	5V1		29	0V1	0V7 Videomode
9	5V1		30	0V2	1V3 in Standby
10	5V1		31	3V6	
11	Not used		32	4V7	
12	11V	Varies with brightness control	33	0V5 (10V range)	
13	10V5	Varies with colour control	34	2V2	
14	0V7 (Min volume)	Varies with volume control	35	3V7	Varies with programme number
15	0V2	0V5 when remote commands received	36	5V1	
16	5V0		37	0V	
17	Not used		38	5V0	
18	Not used		39	—	
19	Not used		40	—	
20	4V2	0V2 Videomode	41	—	
21	0V		42	5V0	

IC1102 M58655P			
Pin	**Volts**	**Pin**	**Volts**
1	5V1	8	5V0
2	−30V	9	5V0
3	Not used	10	Not used
4	4V8	11	Not used
5	Not used	12	Not used
6	5V0	13	0V
7	5V0	14	Not used

IC1104 M50450			
Pin	**Volts**	**Pin**	**Volts**
1	0V	11	0V4
2	4V9	12	Not used
3	0V3	13	0V4
4	0V	14	5V0
5	0V	15	5V0
6	0V	16	5V0
7	Not used	17	5V0
8	Not used	18	4V8
9	5V0	19	5V0
10	−0V5	20	5V0

	Q1101	**Q1102**	**Q1103**	**Q1105**	**Q1106**	**Q1107**	**Q1108**	**Q1110**
E	0V	0V	5V1	0V	0V	12V3	0V	12V5
B	0V5	0V	4V8	0V1 (0V6 Video Mode)	0V7	11V6	0V7	11V7
C	1V6	4V9	5V1	6V0 (0V Video Mode)	0V1	12V4	0V2	−0V4 (12V Video Mode)

	Q1112	**Q1180**	**Q1181**	**Q1201**	**Q1202**
E	0V	0V	0V	0V	12V7
B	0V7	0V1 (0V6 Video mode)	3V3 (2V8 Video mode)	0V6	13V
C	0V	11V5 (9V5 Video mode)	0V2 (0V6 Video mode)	0V (0V5 on remote commands)	12V7

A.V. BOARD VOLTAGES (REMOTE MODELS)

IC1301 TLP651			
Pin	**Volts**	**Pin**	**Volts**
1	Not used	5	0V
2	11V5	6	-0V4(1V0)
3	10V	7	0V1(0V7)
4	Not used	8	-0V4(12V)

IC1302 TLP651			
Pin	**Volts**	**Pin**	**Volts**
1	Not used	5	0V
2	12V	6	1V(1V5)
3	10V6	7	0V7
4	Not used	8	11V5

IC1401 TLP731			
Pin	Volts	Pin	Volts
1	11V5	5	-0V3(1V0)
2	10V3	6	0V2(0V5)
3	Not used		
4	0V		

IC1402 TLP731			
Pin	Volts	Pin	Volts
1	9V1	5	0V9
2	8V0	6	0V5
3	Not used		
4	0V		

	Q1301	**Q1303**	**Q1314**	**Q1321**	**Q1322**	**Q1323**
E	2V0	0V4 (0V8)	7V5 (5V4)	0V (0V3)	0V (5V6)	2V7 (3V5)
B	2V7	1V0 (1V5)	**8V2 (6V0)**	–0V4 (1V0)	–0V2 (5V7)	3V3 (4V0)
C	10V	8V2 (6V0)	**11V5**	–0V4 (11V)	12V	12V

	Q1324	**Q1325**	**Q1326**	**Q1401**	**Q1402**	**Q1403**
E	3V3 (2V8)	1V4 (0V)	0V	1V4	0V3	9V5
B	2V5 (2V0)	2V0 (0V)	–0V1 (0V7)	2V0	1V0	10V
C	0V	10V5	2V0 (0V)	10V5	10V	11V5

	Q1421	**Q1422**	**Q1423**	**Q1424**
E	0V (0V3)	2V3 (6V2)	2V3 (6V2)	1V5
B	–0V3 (1V0)	–0V1 (6V6)	3V0 (2V5)	2V0
C	–0V4 (9V8)	9V1	9V1	8V1

NB: On this board there is a "COLD" section and a "LIVE" section. When taking measurements of "COLD" section use the earth line of T1301 secondary. When measuring the "LIVE" section use chassis earth. All bracked voltages indicate differences with video button pressed on.

BASIC ASSEMBLIES

Audio Video Board Assembly	PC259	A517760
C.R.T. Base Assembly CPT 21/2476	PC258	A517790
CPT 2174	PC258	A517780
Degaussing Coil Assembly 21" Models		A518020
Degaussing Coil 24" Models		2164781
Main Chassis Assembly CPT2174		A517690
CPT2176		A517740
CPT2476		A517820
Remote Control Transmitter (Complete)		2970074

PRESENTATION PARTS

Control Door CPT2176	3796811
⚠ C.R.T. Type A51 JFC61X 21" Models	T154001
⚠ C.R.T. Type A56JKZ61X 04 24" Models	2357211
⚠ Cabinet Back CPT2174	X261892
CPT2176	X261891
CPT2476	X261881
Cabinet Assembly CPT2174	A303781
CPT2176	A303782
CPT2476	X212062
HITACHI Badge	X540401
⚠ Mains Lead	E846563
On/Off Knob	3266701
Operating Guide CPT2174	X830501
CPT21/2476	X830518
Preset Driver for Controls	3794331
TV Stand Assembly 21" Models	A303650
24" Models	A303700

MISCELLANEOUS ITEMS

⚠ Antenna Isolator	2981455
⚠ Focus Socket Cover	2784331
⚠ F901 T3.15A	2721293
Fuse Holding Clips	2720221
Headphone Socket	2671351
⚠ On/Off Switch CPT2174	2632501
CPT21/2476	2632502
Speaker CPT2174/76	2412642
CPT2476	2412665
Spark Gap SG851	2340037
Switch Block S001 CPT2174	2632471
Switch Block S002/3 CPT2174	2632472
Switch Block S001 CPT21/2476	2632363
7 Pin Din Socket CPT21/2476	E825711
Tuner Type ET568A	2426033
TH401	2340661
⚠ TH901	2340471
VR Switch Block CPT21/2476 S002	2632589

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

RESISTOR	ABBREVIATIONS
CF	Carbon Film
MO	Metal Oxide
FF	Fusible Film
VR	Variable Control
MF	Metal Film
WW	Wire Wound

PARTS LIST FOR CPT 2174 MODELS

Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R001	0187113M	100K	CF	5	1/16
R004	0179561M	2M2	MF	5	1/8
R202	0187081M	4K7	CF	5	1/16
R203	0187087M	8K2	CF	5	1/16
R204	0187109M	68K	CF	5	1/16
R206	0187113M	100K	CF	5	1/16
R207	0187107M	56K	CF	5	1/16
R208	0187083M	5K6	CF	5	1/16
R209	0187091M	12K	CF	5	1/16
R210	0150113	5K0	VR	A.G.C. Preset	
R211	0187097M	22K	CF	5	1/16
R212	0100073F	2K2	CF	5	1/8
R213	0187089M	10K	CF	5	1/16
R214	0187051M	270	CF	5	1/16
R215	0100053M	330	CF	5	1/8
R216	0187051	270	CF	5	1/16
R217	0114147M	470	CF	5	1/4
R218	0187067M	1K2	CF	5	1/16
R219	0187059M	560	CF	5	1/16
R220	0187089M	10K	CF	5	1/16
R221	0187097M	22K	CF	5	1/16
R222	0187097	22K	CF	5	1/16
R231	0187065M	1K0	CF	5	1/16
R301	0187069M	1K5	CF	5	1/16
R302	0187069M	1K5	CF	5	1/16
R303	0187051M	270	CF	5	1/16
R304	0187085M	6K8	CF	5	1/16
R305	0187093M	15K	CF	5	1/16
R306	0187095M	18K	CF	5	1/16
R308	0100101M	33K	CF	5	1/8
R309	0187105M	47K	CF	5	1/16
R310	0100099M	27K	CF	5	1/8
R312	0187087M	8K2	CF	5	1/16
R313	0100095M	18K	CF	5	1/8
R314	0100091G	12K	CF	5	1/8
R315	0187095M	18K	CF	5	1/4
R316	0100081M	4K7	CF	5	1/8
R317	0100053M	330	CF	5	1/8
R318	0114151M	680	CF	5	1/4
R319	0100081F	4K7	CF	5	1/8
R401	0187109M	68K	CF	5	1/16
R402	0179556M	560K	MF	5	1/8
R403	0187073M	2K2	CF	5	1/16
R404	0187097M	22K	CF	5	1/16
R405	0187075	2K7	CF	5	1/16
R406	0187081M	4K7	CF	5	1/16
R407	0187065M	1K0	CF	5	1/16
R408	0187087M	8K2	CF	5	1/16
R409	0187065M	1K0	CF	5	1/16
R410	0110113S	47	MO	5	1
R412	0187109M	68K	CF	5	1/16
R414	0187057M	470	CF	5	1/16
R416	0100083	5K6	CF	5	1/8
R421	0100065M	1K0	CF	5	1/8
R422	0100109M	68K	CF	5	1/8
R423	0110117S	68	MO	5	1
R424	0113781M	18K	CF	5	1/2
R427	0113781M	18K	CF	5	1/2
R430	0114139M	220	CF	5	1/4
R502	0187069M	1K5	CF	5	1/16
R503	0187059M	560	CF	5	1/16
R504	0187081M	4K7	CF	5	1/16
R507	0179537M	3M9	MF	5	1/8
R508	0179536M	1M0	MF	5	1/8
R509	0100067M	1K2	CF	5	1/8
R510	0150035	1K0	VR	Delay Line Balance	
R511	0100059M	560	CF	5	1/8
R512	0187067M	1K2	CF	5	1/16
R513	0187065M	1K0	CF	5	1/16
R514	0187087M	8K2	CF	5	1/16
R515	0100079M	3K9	CF	5	1/8
R516	0187077M	3K3	CF	5	1/16
R517	0187077M	3K3	CF	5	1/16
R518	0100077M	3K3	CF	5	1/8
R519	0100045M	150	CF	5	1/8
R520	0100045M	150	CF	5	1/8
R521	0100045M	150	CF	5	1/8
R522	0187047M	180	CF	5	1/16
R524	0150531			Customer Controls	
R601	0100059M	560	CF	5	1/8
R602	0100115M	120K	CF	5	1/8
R603	0100115M	120K	CF	5	1/8
R604	0100083M	5K6	CF	5	1/8
R605	0100099	27K	CF	5	1/8
R611	0100117M	150K	CF	5	1/8
R613	0100107M	56K	CF	5	1/8
R620	0114003M	2R7	CF	5	1/4
R621	0114001M	2R2	CF	5	1/4
R623	0150560	200	VR	Vert Amplitude	
R624	0100049M	220	CF	5	1/8
R625	0187089M	10K	CF	5	1/16
R681	0113731M	180	CF	5	1/2
R690	0114161M	1K0	CF	5	1/4
R701	0114139M	220	CF	5	1/4
R702	0100121M	220K	CF	5	1/8
R703	0113791	47K	CF	5	1/2
R704	0100041M	100	CF	5	1/8
R705	0100133M	680K	CF	5	1/8
R706	0187075M	2K7	CF	5	1/16
R708	0179558	820K	MF	5	1/8
R710	0151330	100K	VR	H. Phase	
R711	0187095M	18K	CF	5	1/16
R712	0100053M	330	CF	5	1/8
R713	0100097M	22K	CF	5	1/8
R714	0100051M	270	CF	5	1/8
R715	0100083M	5K6	CF	5	1/8
R716	0187075M	2K7	CF	5	1/16
R725	0110257S	3K3	MO	5	2
R726	0110149S	1K5	MO	5	1
R756	0100083M	5K6	CF	5	1/8
R757	0100017M	10	CF	5	1/8
⚠R758	0119505S	2R2	FF	5	1/4
R759	0110121S	100	MO	5	1
⚠R761	0119512S	1R0	FF	5	1/4
⚠R762	0119505S	2R2	FF	5	1/4
R765	0114221M	68K	CF	5	1/4
R766	0114221M	68K	CF	5	1/4
⚠R771	0119505S	2R2	FF	5	1/4
R772	0113752	1K2	CF	5	1/2
⚠R781	0141148	10	WW	5	7
R791	0113729	150	CF	5	1/2

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Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R795	0113692	4R7	CF	5	½
R796	0113748M	820	CF	5	½
R851	0113760	2K7	CF	5	½
R852	0113760	2K7	CF	5	½
R853	0113760	5K7	CF	5	½
R854	0110271S	12K	MO	5	2
R855	0110271S	12K	MO	5	2
R856	0110271S	12K	MO	5	2
R857	0179532M	470K	MF	5	½
R858	0100067M	1K2	CF	5	⅛
R859	0100067M	1K2	CF	5	⅛
R860	0100067M	1K2	CF	5	⅛
R861	0151716	5K0	VR	Red Background	
R862	0151716	5K0	VR	Green Background	
R863	0151716	5K0	VR	Blue Background	
R864	0150002	300	VR	Red Drive	
R866	0150002	300	VR	Blue Drive	
R867	0100049M	220	CF	5	⅛
R868	0100051M	270	CF	5	⅛
R869	0100049M	220	CF	5	⅛
R871	0100041M	100	CF	5	⅛
R873	0100105M	47K	CF	5	⅛
R875	0100053M	330	CF	5	⅛
R876	0100041M	100	CF	5	⅛
R877	0100041M	100	CF	5	⅛
R878	0100041M	100	CF	5	⅛
⚠R891	0119690	OR27	FF	5	¼
R901	0141142	3R9	WW	5	7
R902	0114223M	82K	CF	5	¼
R903	0114223M	82K	CF	5	¼
R904	0114223M	82K	CF	5	¼
R905	0113701M	10	CF	5	½
R906	0113719M	56	CF	5	½
R907	0190171	1RO	WW	10	1
R908	0113701M	10	CF	5	½
R910	0100063M	820	CF	5	⅛
R911	0100067M	1K2	CF	5	⅛
R912	0114297	470K	CF	5	¼
⚠R920	0119514	10	FF	5	¼
R1101	0187093M	15K	CF	5	1/16
R1102	0187089M	10K	CF	5	1/16
R1103	0187095M	18K	CF	5	1/16
R1104	0187095M	18K	CF	5	1/16
R1110	0187065M	1K0	CF	5	1/16
R1114	0187063M	820	CF	5	1/16
R1119	0187065M	1K0	CF	5	1/16
R1121	0114209M	22K	CF	5	¼
R1123	0187089M	10K	CF	5	1/16
R1124	0187089M	10K	CF	5	1/16
R1125	0187089M	10K	CF	5	1/16
R1126	0187113M	100K	CF	5	1/16
R1127	0187113M	100K	CF	5	1/16
R1128	0187113M	100K	CF	5	1/16
R1129	0187113M	100K	CF	5	1/16
R1130	0187113M	100K	CF	5	1/16
R1139	0187087M	8K2	CF	5	1/16
R1140	0187105M	47K	CF	5	1/16
R1141	0100041	100	CF	5	⅛
R1150	0100057M	470	CF	5	⅛
R1160	0110273S	15K	MF	5	2
R1175	0187105M	47K	CF	5	1/16
R1176	0187065	1K0	CF	5	1/16
R1182	0187073M	2K2	CF	5	1/16
R1183	0187051M	270	CF	5	1/16
R1184	0187075M	2K7	CF	5	1/16
R1185	0187065M	1K0	CF	5	1/16
R1186	0187085M	6K8	CF	5	1/16

Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R1190	0187105M	47K	CF	5	1/16
R1191	0100041M	100	CF	5	⅛
R1192	0100073F	2K2	CF	5	⅛

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CAPACITOR ABBREVIATIONS

C	Ceramic
EL	Electrolytic
PF	Plastic Film
MP	Metalised Paper
MPO	Metalised Polyester
TA	Tantalum

Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C004	0274775R	100n	PF	10	50
C007	0253046R	10μ	EL		16
C201	0274755R	2n2	PF	10	50
C203	0274755R	2n2	PF	10	50
C204	0253050R	100μ	EL		16
C205	0274755R	2n2	PF	10	50
C206	0253082R	1μ0	EL		50
C207	0246464R	100p	C	5	50
C208	0274755R	2n2	PF	10	50
C209	0246467R	130p	C	5	50
C210	0246430R	10p	C	0.5	50
C211	0274767R	22n	PF	10	50
C212	0246464R	100p	C	5	50
C213	0251101R	3μ3	EL		25
C214	0274755R	2n2	PF	10	50
C215	0248631R	1p0	C	0.25p	50
C216	0274755R	2n2	PF	10	50
C217	0274763R	10n	PF	10	50
C219	0274763R	10n	PF	10	50
C220	0248633R	3p0	C	0.25p	50
C221	0248672	33p	C	5	50
C222	0276341R	100n	PF	10	50
C223	0276811	1n0	PF	5	50
C225	0246452	33p	C	5	50
C301	0253066R	10μ	EL		25
C304	0274763R	10n	PF	10	50
C305	0251090F	10μ	EL		25
C306	0253082R	1μ0	EL		25
C308	0253083R	2μ2	EL		50
C309	0253050R	100μ	EL		16
C311	0253050R	100μ	EL		16
C312	0246454F	39p	C	5	50
C313	0253049F	47μ	EL		16
C314	0276831	47n	PF	5	50
C401	0244509R	4n7	C	10	500
C402	0248640R	10p	C	0.25p	50
C403	0253081R	0μ47	EL		50
C404	0253046R	10μ	EL		16
C405	0274763R	10n	PF	10	50
C406	0253047R	22μ	EL		16
C407	0248694F	270p	C	5	50
C408	0274763R	10n	PF	10	50
C409	0248672R	33p	C	5	50
C410	0274763R	10n	PF	10	50
C411	0274763R	10n	PF	10	50
C412	0274763R	10n	PF	10	50
C413	0255053F	470μ	EL		16
C416	0274765R	15n	PF	10	50
C418	0252715F	47μ	EL		16
C420	0253066R	10μ	EL		25
C421	0243510R	560p	C	10	500
C422	0243504R	180p	C	10	500
C424	0253457F	22μ	EL		16
C425	0253455F	4μ7	EL		160
C442	0274767R	22n	PF	10	50
C501	0248680R	68p	C	5	50
C502	0248670R	27p	C	5	50
C503	0248678R	56p	C	5	50
C504	0274763R	10n	PF	10	50
C505	0253082R	1μ0	EL		50
C506	0274763R	10n	PF	10	50
C507	0251073F	2μ2	EL		16
C508	0276341F	100n	PF	10	50
C509	0274763R	10n	PF	10	50
C510	0274763R	10n	PF	10	50
C511	0276337F	47n	PF	10	50
C512	0253082R	1μ0	EL		50
C513	0276337	47n	PF	10	50
C514	0274763R	10n	PF	10	50
C515	0274763R	10n	PF	10	50
C516	0248676R	47P	C	5	50
C517	0248678R	56P	C	5	50
C518	0274763R	10n	PF	10	50
C519	0274763R	10n	PF	10	50
C520	0244113R	330p	C	10	50
C521	0244113R	330p	C	10	50
C522	0244113R	330p	C	10	50
C601	0274669R	33n	PF	5	50
C603	0253082R	1μ0	EL		50
C611	0276835F	100n	PF	5	50
C613	0276833F	68n	PF	5	50
C621	0253055F	2200μ	EL		16
C622	0292710F	2μ2	TA		20
C681	0244507R	3n3	C	10	500
C682	0253090F	100μ	EL		50
C683	0279859F	100n	PF	10	100
C684	0247882R	33p	C	10	500
C686	0274755R	2n2	PF	10	50
C689	0276337F	47n	PF	10	50
C700	0253050R	100μ	EL		16
C701	0253085R	4μ7	EL		50
C702	0244104R	1n8	C	10	50
C703	0274767R	22n	PF	10	50
C704	0274765R	15n	PF	10	50
C705	0253082R	1μ0	EL		50
C706	0274757R	3n3	PF	10	50
C707	0274655R	2n2	PF	5	50
C708	0244104R	1n8	C	10	50
C711	0244118R	470p	C	10	50
C721	0248684R	100p	C	5	50
C722	0244501R	1n0	C	10	500
C723	0299918F	22n	PF	10	200
C751	0252741R	3μ3	EL		50
C753	0252718	330μ	EL		16
C762	0252732F	470μ	EL		25
C764	0253093F	470μ	EL		50
C765	0253473F	22μ	EL		250
C766	0279859F	100n	PF	10	100
C767	0244501R	1n0	C	10	500
C768	0243509	470p	C	10	500
C781	0299727F	7n5	PF	5	1K6
C782	0243824	470P	C	10	2K5
C783	0299929F	180n	PF	10	200
C784	0299930F	220n	PF	10	200
C785	0244507R	3n3	C	10	500
C786	0244139R	1n0	C	10	50
C787	0243509F	470p	C	10	500
C791	0253054	1000μ	EL		16
C792	0244501R	1n0	C	10	500
C793	0243504	180p	C	10	500
C795	0279849F	15n	PF	10	100
C796	0243512R	820p	C	10	500
C853	0244117R	680P	C	10	50

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Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C855	0244117R	680P	C	10	50
C856	0244115R	560P	C	10	50
C858	0244215	2n2	C	10	2K0
C860	0248690R	180p	C	5	50
⚠C901	0299529	100n	PF	10	250
C901A	0249396	10n	C	10	125
⚠C902	0299977F	4n7	PF	5	630
⚠C903	0299977F	4n7	PF	5	630
⚠C904	0299981F	10n	PF	5	630
C905	0253455F	4μ7	EL		160
C906	0259134F	100μ	EL		400
C908	0243510R	560p	C	10	500
⚠C909	0258673F	220μ	EL		160
C910	0257537F	4μ7	EL		160
⚠C911	0259135F	2μ2	EL		50
C912	0243510	560P	C	10	500
C913	0253046R	10μ	EL		16
C927	0244501R	1n0	C	10	500
C1101	0244139R	1n0	C	10	50
C1104	0277025	100n	PF	10	50
C1105	0277025	100n	PF	10	50
C1106	0244116R	180p	C	10	50
C1107	0244117R	680p	C	10	50
C1108	0244139F	1n0	C	10	50
C1110	0253030R	100μ	EL		10
C1111	0248672R	33p	C	5	50
C1112	0248672R	33p	C	5	50
C1114	0253047R	22μ	EL		16
C1115	0253082R	1μ0	EL		50
C1116	0244171R	10n	C		50
C1117	0253082R	1μ0	EL		50
C1118	0253046R	10μ	EL		16
C1119	0244171R	10n	C		50
C1120	0248498R	22p	C	5	50
C1121	0246448R	22p	C	5	50
C1122	0244171R	10n	C		50
C1123	0248684R	100p	C	5	50
C1127	0244115R	560P	C	10	50
C1129	0248690R	180P	C	5	50
C1130	0244118R	470P	C	10	50
C1141	0244139	1n0	C	10	50
C1145	0244171R	10n	C		50
C1157	0253046R	10μ	EL		16
C1171	0253050R	100μ	EL		16

Symbol No.	Stock No.	Description
ICs, TRANSISTORS AND DIODES		
IC201	2913402	HA11485NT
IC501	2913612	HA51338SP-1
IC681	2368501	μPC1378H
IC1101	2913561	M50161-554SP
IC1102	2910751	M58658
IC1104	2368742	M50143-006P
Q201	2320598	2SC458B/C/D
Q202	2320631	2SA673B/C
Q203	2320631	2SA673B/C
Q204	2320598	2SC458B/C/D
Q301	2320637	2SA673C/D
Q302	2320596	2SC458C/D
Q421	2321591	2SD401A/K
Q422	2321591	2SD401A/K
Q721	2321992	2SC2271M/N
Q781	2324415	2SD1453-03
Q791	2324611	2SD882Q/P
Q851	2322562	2SC2688K/L
Q852	2322562	2SC2688K/L
Q853	2322562	2SC2688K/L
Q858	2321992	2SC2271MN
Q901	2326622	MN650
Q902	2326631	CRSAS-8
Q1101	2321543	2SC1740Q/R/S
Q1102	2323344	2SD637R/S
Q1103	2320596	2SC458C/D
Q1104	2323344	2SD637R/S
Q1110	2320596	2SC458C/D
D001	T531053	IN4148
D201	T531053	IN4148
D202	T531053	IN4148
D301	T531053	IN4148
D302	2330251M	V06C
D303	T531053	IN4148
D421	T531053	IN4148
D621	T531053	IN4148
D681	2334592M	EM1Z
D700	2334592M	EMIZ
D701	T531053	IN4148
D702	T531053	IN4148
D751	2333011M	SM-1-02FRA
D761	2333011M	SM-1-02FRA
D762	2334581M	ES1A
D763	2334581	ES1A
D772	2333011M	SM-1-02FRA
D791	T531053	IN4148
D792	T531053	IN4148
D793	2333011M	SM-1-02FRA
⚠D901	2336783	LB156LFB(1)
D902	2334581	ES1A
D903	2334581	ES1A
D904	2333011M	SM-1-02FRA
D905	2333011M	SM-1-02FRA
D906	2333011M	SM-1-02FRA

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Symbol No.	Stock No.	Description
D1101	T531053	IN4148
D1102	T531053	IN4148
D1103	T531053	IN4148
D1104	T531053	IN4148
D1106	T531053	IN4148
D1107	T531053	IN4148
D1108	T531053	IN4148
D1109	T531053	IN4148
D1110	T531053	IN4148
D1111	T531053	IN4148
D1112	T531053	IN4148
D1113	T531053	IN4148
ZD001	2330634M	HZ7A/B
ZD201	2334144	RD6V2EB3
ZD301	2331849M	HZ12C3
ZD601	2331154M	HZ12A/B/C
ZD752	2335461M	HZ24-12
ZD753	2331815M	HZ-7B2
ZD791	2332841M	HZ11
ZD901	2331161M	HZ11A/B/C
ZD1151	2334133	RD5V6EB2
ZD1152	2334305	RD30EB4
ZD1153	2331084	μPC-574JAG
ZD1201	2331797	HZ5C-1
COILS AND TRANSFORMERS		
L202	2142952	Trap Coil
L203	2142019	AFC Coil
L204	2142942	Video Detection Coil
L205	2122943M	10μH Axial Coil
L206	2120482	100μH Filter Coil
L207	2143014	High Freq. Coil
L210	2122926M	0μ56 Axial Coil
L301	2122253M	100μH Axial Coil
L302	2122239F	10μH Axial Coil
L401	2122954M	68μH Axial Coil
L402	2142192	SIF Disc Coil
L403	2122945M	15μH Axial Coil
L501	2122944M	12μH Axial Coil
L502	2122944M	12μH Axial Coil
L503	2142652	Phase Coil
L504	2123291M	10μH Axial Coil
L703	2122253M	100μH Axial Coil
L710	2122253F	100μH Axial Coil
L751	2120486	4,700μH Filter Coil
L795	2123331	22μH Coil
L796	2162043	Horiz. Linearity Coil
⚠L901	2122694	Line Filter
L902	2120333	Filter Coil
L1102	2122956M	100μH Axial Coil
L1103	2122956M	100μH Axial Coil
L1104	2122929M	1μH Axial Coil
L1106	2122239T	10μH Axial Coil
T421	2250551	Sound Output Transformer
T501	2141367	Delay Line Transformer
T721	2260021	Horiz. Drive Transformer

Symbol No.	Stock No.	Description
⚠T761	2434274	Flyback Transformer
⚠T901	2213901	Choke Transformer
DELAY LINES, FILTERS, CRYSTALS ETC		
CP201	2300431	HW2211 Saw Filter
CP202	2142244	Ceramic Trap
CP901	2371674	HM9204 Module
MF401	2142603	6MHz Ceramic Filter
X501	2787571	4.43MHz Crystal
X701	2786681	500kHz Crystal
X1101	2163971	4MHz Ceramic Filter
DL301	2164145	Luminance Delay Line
DL501	2791151	Chrominance Delay Line

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RESISTOR	ABBREVIATIONS
CF	Carbon Film
MO	Metal Oxide
FF	Fusible Film
VR	Variable Control
MF	Metal Film
WW	Wire Wound

PARTS LIST FOR CPT 21/2476 MODELS

Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R001	0100103M	39K	CF	5	1/8
R004	0179561M	2M2	MF	5	1/8
R202	0187081M	4K7	CF	5	1/16
R203	0187087M	8K2	CF	5	1/16
R204	0187109M	68K	CF	5	1/16
R206	0187113	100K	CF	5	1/16
R207	0100109M	68K	CF	5	1/8
R208	0187083M	5K6	CF	5	1/16
R209	0187091M	12K	CF	5	1/16
R210	0151254	5K0	VR	A.G.C. Preset	
R211	0187097M	22K	CF	5	1/16
R212	0187073M	2K2	CF	5	1/16
R213	0187089M	10K	CF	5	1/16
R214	0187051M	270	CF	5	1/16
R215	0100053	330	CF	5	1/8
R216	0187052M	300	CF	5	1/16
R217	0114147M	470	CF	5	1/4
R218	0187067M	1K2	CF	5	1/16
R224	0100109F	68K	CF	5	1/8
R230	0100103M	39K	CF	5	1/8
R231	0187065M	1K0	CF	5	1/16
R301	0187069M	1K5	CF	5	1/16
R302	0187069M	1K5	CF	5	1/16
R303	0187051M	270	CF	5	1/16
R304	0187085M	6K8	CF	5	1/16
R305	0187093M	15K	CF	5	1/16
R306	0187095M	18K	CF	5	1/16
R308	0100101M	33K	CF	5	1/8
R309	0187105M	47K	CF	5	1/16
R310	0100099M	27K	CF	5	1/8
R312	0187087M	8K2	CF	5	1/16
R313	0100095M	18K	CF	5	1/8
R316	0100081M	4K7	CF	5	1/8
R317	0100053M	330	CF	5	1/8
R318	0114151M	680	CF	5	1/4
R319	0100081M	4K7	CF	5	1/8
R401	0187109M	68K	CF	5	1/16
R402	0179556M	560K	MF	5	1/4
R403	0187073M	2K2	CF	5	1/16
R404	0187097M	22K	CF	5	1/16
R405	0100075F	2K7	CF	5	1/8
R406	0187081M	4K7	CF	5	1/16
R407	0187065M	1K0	CF	5	1/16
R408	0187085M	6K8	CF	5	1/16
R409	0187065M	1K0	CF	5	1/16
R410	0110113S	47	MO	5	1
R412	0187109	68K	CF	5	1/16
R414	0187049M	220	CF	5	1/16
R416	0100083F	5K6	CF	5	1/8
R421	0100065M	1K0	CF	5	1/8
R422	0100109M	68K	CF	5	1/8
R423	0110117S	68	MO	5	1
R424	0110169S	10K	MO	5	1
R430	0114139M	220	CF	5	1/4
R502	0187069M	1K5	CF	5	1/16
R503	0187059M	560	CF	5	1/16
R504	0187081M	4K7	CF	5	1/16
R507	0179537M	3M9	MF	5	1/8
R508	0179536M	1M0	MF	5	1/8
R509	0100067M	1K2	CF	5	1/8
R510	0150035	1K0	VR	Delay Line Balance	
R511	0100059M	560	CF	5	1/8
R512	0187067M	1K2	CF	5	1/16
R513	0187067M	1K2	CF	5	1/16
R514	0100079M	3K9	CF	5	1/8
R515	0100087M	8K2	CF	5	1/8
R516	0187077M	3K3	CF	5	1/16
R517	0187077M	3K3	CF	5	1/16
R518	0100077M	3K3	CF	5	1/8
R519	0100045M	150	CF	5	1/8
R520	0100045M	150	CF	5	1/8
R521	0100045M	150	CF	5	1/8
R522	0187047M	180	CF	5	1/16
R601	0100059M	560	CF	5	1/8
R602	0100115M	120K	CF	5	1/8
R603	0100115	120K	CF	5	1/8
R604	0100083M	5K6	CF	5	1/8
R605	0100099	27K	CF	5	1/8
R611	0100117	150K	CF	5	1/8
*R611	0100107	56K	CF	5	1/8
R613	0100107M	56K	CF	5	1/8
R620	0114003M	2R7	CF	5	1/4
R621	0114001M	2R2	CF	5	1/4
*R621	0114004M	3R0	CF	5	1/4
R623	0150560	200	VR	Vert	Height
R624	0100049M	220	CF	5	1/8
R625	0100089M	10K	CF	5	1/8
*R630	0100101M	33K	CF	5	1/8
*R631	0100099F	27K	CF	5	1/8
R681	0113731	180	CF	5	1/2
*R681	0113733	220	CF	5	1/2
R690	0114161M	1K0	CF	5	1/4
R701	0100049	220	CF	5	1/8
R702	0100123	270K	CF	5	1/8
R703	0113791	47K	CF	5	1/2
R704	0100041M	100	CF	5	1/8
R705	0100133M	680K	CF	5	1/8
R706	0187075M	2K7	CF	5	1/16
R708	0179558	820K	MF	5	1/8
R710	0151330	100K	VR	H. Phase	
R711	0187095M	18K	CF	5	1/16
R712	0100053M	330	CF	5	1/8
R713	0100097M	22K	CF	5	1/8
R714	0100051M	270	CF	5	1/8
R715	0100083M	5K6	CF	5	1/8
R716	0187075M	2K7	CF	5	1/16
R725	0110253S	2K2	MO	5	2
R726	0110253S	2K2	MO	5	2
R756	0100083M	5K6	CF	5	1/8
*R756	0100067M	1K2	CF	5	1/8
R757	0100017M	10	CF	5	1/8
⚠R758	0119505S	2R2	FF	5	1/4
R759	0110121S	100	MO	5	1
⚠R761	0119512S	1R0	FF	5	1/4
R762	0119505S	2R2	FF	5	1/4
R765	0114221M	68K	CF	5	1/4
*R765	0114218M	51K	CF	5	1/4
R766	0114221M	68K	CF	5	1/4
*R766	0114218M	51K	CF	5	1/4
⚠R771	0119505S	2R2	FF	5	1/4
R772	0113752	1K2	CF	5	1/2
R781	0141148	10	WW	5	7

NOTE: When an asterisk appears alongside a part it indicates that component is used on CPT 2476 Model only.

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Symbol No.	Stock No.	Value	Type	%Tol	Wattage
*R781	0141147	5R6	WW	10	7
R791	0113729	150	CF	5	½
R795	0113692M	4R7	CF	5	½
*R795	0113701M	10	CF	5	½
R796	0113748M	820	CF	5	½
R851	0113760	2K7	CF	5	½
R852	0113760	2K7	CF	5	½
R853	0113760	2K7	CF	5	½
R854	0110271S	12K	MO	5	2
R855	0110271S	12K	MO	5	2
R856	0110271S	12K	MO	5	2
R857	0179532M	470K	MF	5	⅛
R858	0100067M	1K2	CF	5	⅛
R859	0100067M	1K2	CF	5	⅛
R860	0100067M	1K2	CF	5	⅛
R861	0151716	5K0	VR	Red Background	
R862	0151716	5K0	VR	Green Background	
R863	0151716	5K0	VR	Blue Background	
R864	0150002	300	VR	Red Drive	
R866	0150002	300	VR	Blue Drive	
R867	0100049M	220	CF	5	⅛
R868	0100051M	270	CF	5	⅛
R869	0100049M	220	CF	5	⅛
R870	0100041M	100	CF	5	⅛
R871	0100041M	100	CF	5	⅛
R872	0100105M	47K	CF	5	⅛
R873	0100105M	47K	CF	5	⅛
R874	0100053M	330	CF	5	⅛
R875	0100053M	330	CF	5	⅛
R876	0100041M	100	CF	5	⅛
R877	0100041M	100	CF	5	⅛
R878	0100041M	100	CF	5	⅛
⚠R891	0119690	OR27	FF	5	1
R901	0141142	3R9	WW	5	7
R902	0114223M	82K	CF	5	¼
R903	0114223M	82K	CF	5	¼
R904	0114223	82K	CF	5	¼
R905	0113712M	30	CF	5	½
R905A	01101010S	15	MO	5	1
*R905A	0113712M	30	CF	5	½
R906	0113721M	68	CF	5	½
R907	0190171	1RO	WW	5	1
R908	0113701M	10	CF	5	½
R910	0100063M	820	CF	5	⅛
R911	0100067M	1K2	CF	5	⅛
R913	0110221S	100	MO	5	2
R914	0100077R	3K3	CF	5	⅛
R915	0114165M	1K5	CF	5	¼
R916	0100041M	100	CF	5	⅛
R917	0100089G	10K	CF	5	⅛
R918	0110275S	18K	MO	5	2
R919	0114149	560	CF	5	¼
⚠R920	0119514	10	FF	5	¼
*R925	0179551	180K	MF	5	⅛
R1101	0100065	1K0	CF	5	⅛
R1108	0187065M	1K0	CF	5	1/16
R1111	0187095M	18K	CF	5	1/16
R1112	0187095M	18K	CF	5	1/16
R1114	01102735	15K	MO	5	2
R1120	0100115M	120K	CF	5	⅛
R1121	0100115M	120K	CF	5	⅛
R1122	0100089M	10K	CF	5	⅛
R1125	0187097M	22K	CF	5	1/16
R1128	0187089M	10K	CF	5	1/16
R1130	0187113M	100K	CF	5	1/16

Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R1131	0187065M	1K0	CF	5	1/16
R1132	0187101M	33K	CF	5	1/16
R1132A	0187105M	47K	CF	5	1/16
R1151	0187097M	22K	CF	5	1/16
R1154	0187075M	2K7	CF	5	1/16
R1158	0187053	330	CF	5	1/16
R1167	0187097M	22K	CF	5	1/16
R1168	0187081	4K7	CF	5	1/16
R1169	0187065M	1K0	CF	5	1/16
R1171	0100065	1K0	CF	5	⅛
R1172	0100065	1K0	CF	5	⅛
R1180	0187065M	1K0	CF	5	1/16
R1181	0100065	1K0	CF	5	⅛
R1182	0187105M	47K	CF	5	1/16
R1183	0100053	330	CF	5	⅛
R1190	0100097	22K	CF	5	⅛
R1191	0100091	12K	CF	5	⅛
R1193	0100113	100K	CF	5	⅛
R1194	0187089M	10K	CF	5	1/16
R1201	0187065M	1K0	CF	5	1/16
R1202	0187019	12	CF	5	1/16
R1204	0187085M	6K8	CF	5	1/16
R1207	0187089M	10K	CF	5	1/16
R1301	0100038M	75	CF	5	⅛
R1302	0100087M	8K2	CF	5	⅛
R1303	0100075M	2K7	CF	5	⅛
R1304	0113725M	100	CF	5	½
R1305A/B	0113715	39	CF	5	½
R1306	0119512	1R0	FF	5	¼
R1307	0187091M	12K	CF	5	1/16
R1308	0187079M	3K9	CF	5	1/16
R1309	0187049M	220	CF	5	1/16
R1310	0100041M	100	CF	5	⅛
R1311	0150037	5K0	VR	Gain Control	
R1312	0113733M	220	CF	5	½
R1313	0187089M	10K	CF	5	1/16
R1314	0100038M	75	CF	5	⅛
R1321	0187091M	12K	CF	5	1/16
R1323	0187079M	3K9	CF	5	1/16
R1324	0150036	2K0	VR	Gain Control	
R1325	0100041M	100	CF	5	⅛
R1326	0187097M	22K	CF	5	1/16
R1327	0187099M	27K	CF	5	1/16
R1328	0100041M	100	CF	5	⅛
R1329	0100041M	100	CF	5	⅛
R1330	0100055M	390	CF	5	⅛
R1332	0100069M	1K5	CF	5	⅛
R1333	0100055M	390	CF	5	⅛
R1334	0187095M	18K	CF	5	1/16
R1335	0187059M	560	CF	5	1/16
R1336	0137567F	470	CF	5	¼
R1337	0187111M	82K	CF	5	1/16
R1338	0187099M	27K	CF	5	1/16
R1340	0113725M	100	CF	5	½
R1341	0100089M	10K	CF	5	⅛
R1342	0100077M	3K3	CF	5	⅛
R1401	0187105M	47K	CF	5	1/16
R1402	0187105M	47K	CF	5	1/16
R1403	0187105M	47K	CF	5	1/16
R1404	0113737M	330	CF	5	½
R1405	0187101M	33K	CF	5	1/16
R1406	0187079M	3K9	CF	5	1/16
R1407	0150037	5K0	VR	Gain Control	
R1408	0100041M	100	CF	5	⅛
R1409	0100061M	680	CF	5	⅛
R1410	0187089M	10K	CF	5	1/16
R1411	0100041M	100	CF	5	⅛

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Symbol No.	Stock No.	Value	Type	%Tol	Wattage
R1412	0187041M	100	CF	5	1/16
R1421	0187101M	33K	CF	5	1/16
R1422	0187079M	3K9	CF	5	1/16
R1423	0150037	5K0	VR	Gain Control	
R1424	0100041M	100	CF	5	1/8
R1425	0187105M	47K	CF	5	1/16
R1426	0187105M	47K	CF	5	1/16
R1427	0100069M	1K5	CF	5	1/8
R1428	0187111M	82K	CF	5	1/16
R1429	0187107M	56K	CF	5	1/16
R1430	0113725M	100	CF	5	1/2
R1431	0187065M	1K0	CF	5	1/16
R1432	0187065M	1K0	CF	5	1/16
R1455	0113731M	180	CF	5	1/2

CAPACITOR ABBREVIATIONS

C	Ceramic
EL	Electrolytic
PF	Plastic Film
MP	Metalised Paper
MPO	Metalised Polyester
TA	Tantalum

Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C004	0277025	100n	PF	10	50
C007	0253046R	10µ	EL		16
C201	0274755R	2n2	PF	10	50
C203	0274755R	2n2	PF	10	50
C204	0253050R	100µ	EL		16
C205	0274755R	2n2	PF	10	50
C206	0253082R	1µ0	EL		50
C207	0246464R	100p	C	5	50
C208	0274755R	2n2	PF	10	50
C209	0246467R	130p	C	5	50
C210	0246430R	10p	C	0.5	50
C211	0274767R	22n	PF	10	50
C212	0246464R	100p	C	5	50
C213	0251101R	3µ3	EL		25
C214	0274755R	2n2	PF	10	50
C215	0248631F	1p0	C	0.25p	50
C216	0274755R	2n2	PF	10	50
C217	0276329F	10n	PF	10	50
C219	0274763R	10n	PF	10	50
C220	0248633R	3p0	C	0.25p	50
C221	0248672R	33p	C	5	50
C223	0276811	1n0	PF	5	50
C225	0246452	33p	C	5	50
C301	0253066R	10µ	EL		25
C302	0248680R	68p	C	5	50
C303	0244109	4n7	C	5	50
C304	0274763R	10n	PF	10	50
C305	0251090F	10µ	EL		25
C306	0253082R	1µ0	EL		50
C309	0253050R	100µ	EL		16
C312	0246454F	39p	C	5	50
C313	0253049	47µ	EL		16
C314	0276831	47n	PF	5	50
C401	0299981	10n	PF	5	160
C402	0248640R	150p	C	0.25p	50
C403	0253081R	0µ47	EL		50
C404	0253046R	10µ	EL		16
C405	0274763R	10n	PF	10	50
C406	0253047R	22µ	EL		16
C408	0274765R	15n	PF	10	50
C409	0248672R	33p	C	5	50
C410	0274763R	10n	PF	10	50
C411	0274763R	10n	PF	10	50
C412	0274763R	10n	PF	10	50
C413	0253053F	470µ	EL		16
C416	0274765R	15n	PF	10	50
C418	0252715	47µ	EL		16
C420	0253066R	10µ	EL		25
C421	0243510R	560p	C	10	500
C422	0243504R	180p	C	10	500
C424	0253457F	22µ	EL		160
C425	0258584	10µ	EL		160
C442	0277025F	100n	PF	10	50
C501	0248680R	68p	C	5	50
C502	0248670R	27p	C	5	50

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Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C503	0248678R	56p	C	5	50
C504	0274763R	10n	PF	10	50
C505	0253082R	1μ0	EL		50
C506	0274763R	10n	PF	10	50
C507	0251073F	2μ2	EL		16
C508	0277025F	100n	PF	10	50
C509	0274763R	10n	PF	10	50
C510	0274763R	10n	PF	10	50
C511	0277021F	47n	PF	10	50
C512	0253082R	1μ0	EL		50
C513	0277021	47n	PF	10	50
C514	0274763R	10n	PF	10	50
C515	0274763R	10n	PF	10	50
C516	0248676R	47P	C	5	50
C517	0248678R	56P	C	5	50
C518	0274763R	10n	PF	10	50
C519	0274763R	10n	PF	10	50
C520	0244113R	330p	C	10	50
C521	0244113R	330p	C	10	50
C522	0244113R	330p	C	10	50
C601	0274669R	33n	PF	5	50
*C601	0276835F	100n	PF	5	50
C603	0253082R	1μ0	EL		50
C611	0276835F	100n	PF	5	50
C613	0276833F	68n	PF	5	50
*C613	0253081F	0μ47	EL		50
C621	0253055F	2,200μ	EL		16
C622	0292710F	2μ2	TA		20
*C622	0292706F	1μ0	TA		50
*C630	0252974	1μ0	EL		50
C681	0244507R	3n3	C	10	500
C682	0252747F	100μ	EL		50
C683	0279859F	100n	PF	10	100
*C683	0299045	68n	PF	10	100
C684	0247882	33p	C	5	50
C686	0274755R	2n2	PF	10	100
C689	0277021F	47n	PF	10	50
C700	0253050R	100μ	EL		16
C701	0253085R	4μ7	EL		50
C702	0244104R	1n8	C	10	50
C703	0274767R	22n	PF	10	50
C704	0274765R	15n	PF	10	50
C705	0253082R	1μ0	EL		50
C706	0274757R	3n3	PF	10	50
C707	0274655R	2n2	PF	5	50
C708	0244104R	1n8	C	10	50
C711	0244118R	470p	C	10	50
C721	0248684R	100p	C	5	50
C722	0244501R	1n0	C	10	500
C723	0299918F	22n	PF	10	200
C751	0252741R	3μ3	EL		50
C753	0252718	330μ	EL		16
C762	0252732F	470μ	EL		25
C764	0253093F	470μ	EL		50
C765	0253473F	22μ	EL		250
C766	0279859F	100n	PF	10	100
C767	0244501R	1n0	C	10	100
C768	0243509	470p	C	10	500
⚠C781	0299727F	7n5	PF	5	1K6
⚠*C781	0299723F		PF	5	1K6
⚠*C782	0243824	470P	C	10	2K5
⚠*C782	0243431	1n0	C	20	250 A.C.
C783	0299929F	180n	PF	10	200
*C783	0299934F	470n	PF	10	200
C784	0299930F	220n	PF	10	200
*C784	0299929F	180n	PF	10	200
C785	0244507R	3n3	C	10	500
⚠*C785	0244511	6n8	C	10	500

Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C786	0244139	1n0	C	10	50
C787	0244501F	1n0	C	10	500
C791	0253054	1000μ	EL		16
C792	0244501R	1n0	C	10	500
C795	0279849F	15n	PF	10	100
*C795	0299912F	6n8	PF	10	200
C796	0243512R	820p	C	10	500
C853	0244117R	680P	C	10	50
C855	0244117R	680P	C	10	50
C856	0244117R	680P	C	10	50
C858	0244215	2n2	C	10	2K0
C859	0248690R	180p	C	5	50
C860	0248690R	180p	C	5	50
⚠C901	0299529	100n	PF	20	250
C901A/B	0249396	10n	C		125
⚠C902	0299977F	4n7	PF	5	630
⚠C903	0249395	4n7	C		500
C904	0249396	10n	C		125
C905	0252777F	4μ7	EL		160
⚠C906	0259117	150μ	EL		400
C908	0243510R	560p	C	10	500
⚠C909	0258673F	220μ	EL		160
⚠*C909	0258609	270μ	EL		160
C910	0252777F	4μ7	EL		160
*C910	0253137	4μ7	EL		25
C911	0259135	2μ2	EL		50
C912	0244501R	1n0	C	10	500
C913	0252795	330μ	EL		6v3
C914	0253066	10μ	EL		25
*C914	0253070	100μ	EL		25
C915	0253047R	22μ	EL		16
C918	0277025F	100n	PF	10	50
C927	0244501R	1n0	C	10	500
C930	0244109	4n7	C	5	50
C933	0247842	33p	C	5	500
C934	0244501	1n0	C	10	500
C1101	0253083R	2μ2	EL		50
C1102	0253082R	1μ0	EL		50
C1103	0253066R	10μ	EL		25
C1104	0244139R	1n0	C	10	50
C1105	0248694R	270p	C	5	50
C1106	0276835F	100n	PF	5	50
C1107	0276835F	100n	PF	5	50
C1108	0274663R	10n	PF	10	50
C1109	0253082R	1μ0	EL		50
C1112	0248684R	100p	C	5	50
C1113	0253046R	10μ	EL		16
C1114	0274663R	10n	PF	10	50
C1115	0253046R	10μ	EL		16
C1116	0253013	470μ	EL		6V3
C1117	0248684R	100p	C	5	50
C1118	0248684R	100p	C	5	50
C1119	0248498R	22p	C	5	50
C1120	0248668R	22p	C	5	50
C1122	0248698R	560p	C	5	50
C1123	0248698R	560p	C	5	50
C1126	0248684R	100p	C	5	50
C1127	0253050R	100μ	EL		16
C1128	0253046R	10μ	EL		16
C1130	0244139R	1n0	C	10	50
C1131	0253050R	100μ	EL		16
C1132	0253046F	10μ	EL		16
C1165	0253013F	470μ	EL		6V3
C1170	0244115	560p	C	10	50
C1182	0253070F	100μ	EL		25
C1183	0244105F	2n2	C	10	50

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Symbol No.	Stock No.	Value	Type	%Tol	Voltage
C1201	0244171	10n	C		50
C1202	0253046R	10μ	EL		16
C1203	0253083R	2μ2	EL		50
C1204	0253046R	10μ	EL		16
C1205	0274769R	33n	PF	10	50
C1206	0248696R	330p	C	5	50
C1207	0299013	3n3	PF	10	200
C1208	0253046R	10μ	EL		16
C1301	0253050R	100μ	EL		16
C1302	0253050R	100μ	EL		16
C1303	0253050R	100μ	EL		16
C1304	0253072F	330μ	EL		25
C1305	0253051F	220μ	EL		16
C1311	0276341F	100n	PF	10	50
C1321	0253049R	47μ	EL		16
C1322	0253052F	330μ	EL		16
C1323	0253065R	4μ7	EL		25
C1324	0253050R	100μ	EL		16
C1326	0253046R	10μ	EL		16
C1330	0243437	1n0	C	20	400AC
C1331	0248678R	56p	C	5	50
C1401	0253046R	10μ	EL		16
C1402	0253054F	1000μ	EL		16
C1403	0253046R	10μ	EL		16
C1421	0253046R	10μ	EL		16
C1422	0253050R	100μ	EL		16
C1423	0253054F	1,000μ	EL		16
C1424	0253046R	10μ	EL		16
C1425	0248684R	100p	C	5	50
C1426	0248684R	100p	C	5	50

Symbol No.	Stock No.	Description
ICs, TRANSISTORS AND DIODES		
IC201	2913402	HA11485NT
IC501	2913612	HA51338SP
IC681	2368501	μPC1378H
IC1101	2915081	M50432-551SP
IC1102	2915101	M58655P
IC1104	2915091	M50450-023P
IC1201	2911131	LA7224
IC1301	2913902	TLP651
IC1302	2913902	TLP651
IC1401	2337645	TLP731
IC1402	2337645	TLP731
Q201	2320598	2SC458B/C/D
Q202	2320631	2SA673B/C
Q301	2320637	2SA673C/D
Q302	2320596	2SC458C/D
Q421	2321591	2SD401A/K
Q422	2321591	2SD401A/K
Q721	2321992	2SC2271M/N
Q781	2324415	2SD1453-03
*Q781	2324412	2SD1455
Q791	2324611	2SD882Q/P
Q851	2322562	2SC2688
Q852	2322562	2SC2688
Q853	2322562	2SC2688
Q857	2321992	2SC2271M/7
Q858	2321992	2SC2271M/N
Q901	2326622	MN6500
Q902	2326631	CR5AS-8
Q904	2323271	2SD787/2SD788E
Q905	2320596	2SC458C/D
Q1101	2320595	2SC458D
Q1102	2320596	2SC458C/D
Q1103	2320637	2SA673C/D
Q1105	2320596	2SC458C/D
Q1106	2320596	2SC458C/D
Q1107	2320637	2SA673C/D
Q1108	2320596	2SC458C/D
Q1110	2320637	2SA673C/D
Q1112	2320596	2SC458C/D
Q1180	2320596	2SC458C/D
Q1181	2321351	2SA836/844D/E
Q1201	2320596	2SC458C/D
Q1202	2320596	2SC458C/D
Q1301	T631275	BC548B
Q1303	T631275	BC548B
Q1314	T631275	BC548B
Q1321	T631275	BC548B
Q1322	T631275	BC548B
Q1323	T631275	BC548B
Q1324	T631276	BC558B
Q1325	T631275	BC548B
Q1326	T631275	BC548B
Q1401	T631275	BC548B
Q1402	T631275	BC548B

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Symbol No.	Stock No.	Description
Q1403	T631275	BC548B
Q1421	T631275	BC548B
Q1422	T631275	BC548B
Q1423	T631275	BC548B
Q1424	T631275	BC548B
D001	T531053	IN4148
D201	T531053	IN4148
D203	T531053	IN4148
D204	T531053	IN4148
D301	T531053	IN4148
D302	2330251M	V06C
D421	T531053	IN4148
D621	T531053	IN4148
D681	2334592M	EM1Z
D700	2334592M	EMIZ
D701	T531053	IN4148
D702	T531053	IN4148
D751	2336291	DFA1A2
D761	2333011M	SM-1-02FRA
D762	2334581M	ES1A
D763	2334581M	ES1A
D772	2333011M	SM-1-02FRA
D791	T531053	IN4148
D792	T531053	IN4148
D793	2333011M	SM-1-02FRA
D901	2336782	LB156LFB
D902	2334581	ES1A
*D902	2333003	RU2AM
D903	2334581	ES1A
D904	2333011	SM-1-02FRA
D905	2333011M	SM-1-02FRA
D906	2333011M	SM-1-02FRA
D908	T531053	IN4148
D910	2333011	SM-1-02FRA
D911	T531053	IN4148
D912	T531053	IN4148
D913	2334592	EM1Z-TP
D914	T531053	IN4148
D1111	T531053	IN4148
D1120	T531053	IN4148
D1125	T531053	IN4148
D1126	T531053	IN4148
D1131	T531053	IN4148
D1132	T531053	IN4148
D1133	T531053	IN4148
D1134	T531053	IN4148
D1135	T531053	IN4148
D1201	2336381	PH-309
D1202	2335391	981C-50
D1301	2330551M	V09C
D1321	T531053	IN4148
D1322	T531053	IN4148
D1323	T531053	IN4148
ZD001	2330634M	HZ7A/B
ZD301	2331849M	HZ-12C3
ZD601	2331154M	HZ12A/B/C
ZD752	2335461M	HZ24L-2
*ZD752	2335042M	HZ22-2L
ZD753	2331815M	HZ-7B2
*ZD753	2331797M	HZ5-C1
ZD791	2332841M	HZ11
ZD902	2335461M	HZ24-12
ZD1101	2334144M	RD6.2
ZD1102	2331826	HZ-9 B3
ZD1151	2331797	HZ5C-1
ZD1152	2334305M	RD30EB4
ZD1153	2911031	L5631
ZD1301	2331837	HZ-11C1
ZD1322	2331154M	HZ-12A/B/C

COILS AND TRANSFORMERS

L202	2142952	Trap Coil
L203	2142019	IFT Coil
L204	2142942	Peaking Coil
L205	2122943M	10μH Axial Coil
L206	2120482	100μH Filter Coil
L207	2143014	High Freq. Coil
L210	2122926M	0μ56H Axial Coil
L301	2122253T	100μH Axial Coil
L303	2122239F	10μH Axial Coil
L401	2122949M	33μH Axial Coil
L402	2142192	SIF Disc Coil
L403	2122945M	15μH Axial Coil
L501	2122944M	12μH Axial Coil
L502	2122944M	12μH Axial Coil
L503	2142652	Peaking Coil
L504	2123291M	10μH Axial Coil
L703	2122253	100μH Axial Coil
L751	2120486	4,700μH Filter Coil
L795	2123331	22μH Filter Coil
*L795	2164831	Filter Coil
L796	2162043	Linearity Coil
⚠L901	2122694	Line Filter
L902	2120333	Filter Coil
L903	2120482	100μH Filter Coil
L904	2120482	100μH Filter Coil
L1101	2122253M	100μH Axial Coil
L1102	2122956M	100μH Axial Coil
L1111	2122237M	6μ8H Axial Coil
L1112	2122239F	10μH Axial Coil
L1113	2122239F	10μH Axial Coil
L1114	2122239F	10μH Axial Coil
L1201	2161992	Low Freq. Coil
L1301	2122253M	100μH Axial Coil
L1321	2122253M	100μH Axial Coil
L1322	2122253M	100μH Axial Coil
L1323	2122253M	100μH Axial Coil
T421	2250551	Sound Output Transformer
T501	2141367	Delay Line Transformer
T721	2260021	Horiz. Drive Transformer
⚠T761	2434274	Flyback Transformer
⚠*T761	2434002	Flyback Transformer
⚠T901	2213901	Choke Transformer
⚠*T901	2214141	Choke Transformer
T1301	2213961	Pulse Transformer

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Symbol No.	Stock No.	Description
DELAY LINES, FILTERS, CRYSTALS ETC		
DL301	2164145	Luminance Delay Line
DL501	2791151	Chrominance Delay Line
MF401	2142603	6MHz Ceramic Filter
CP001	2338109	Compound Component
CP002	2338109	Compound Component
CP003	0100322	Compound Component
CP004	2334542	Compound Component
CP005	2334558	Compound Component
CP006	0100303	Compound Component
CP007	2338111	Compound Component
CP008	2338112	Compound Component
CP009	2338302	Compound Component
CP010	0100295	Compound Component
CP011	0100308	Compound Component
CP012	0100313	Compound Component
CP013	2338118	Compound Component
CP014	0100309	Compound Component
CP015	2334542	Compound Component
CP016	0100310	Compound Component
CP201	2300431	HW2211 Saw Filter
CP202	2142244	Ceramic Trap
CP901	2371675	HM9205 Module
X501	2787571	4.43MHz Crystal
X701	2786681	500kHz Crystal
X1101	2164791	4MHz Ceramic Filter

Symbol No.	Stock No.	Description